

THOMAS B. KNUDSEN, Ph.D.

Developmental Systems Biologist (Title 42)
National Center for Computational Toxicology
Office of Research & Development / U.S. Environmental Protection Agency
Research Triangle Park, NC 27711
phone: 919-541-9776 / fax: 919-541-1194
knudsen.thomas@epa.gov

Professional Experience:

- 9/07-Present U.S. EPA National Center for Computational Toxicology (NCCT), RTP, NC
- Member of ToxCast team, prioritization methods for environmental chemicals
 - PI, Virtual Embryo Project: systems modeling of developmental toxicity
 - Acting Director, NCCT (May – September, 2013)
 - President, Teratology Society (2008-09)
- 9/07-Present University of Louisville, Louisville KY, Adjunct Professor (Gratis)
- Department of Molecular, Cellular and Craniofacial Biology, Birth Defects Center
- 6/03-Present Editor-in-Chief, Reproductive Toxicology
- 12/03-9/07 Professor of Molecular, Cellular and Craniofacial Biology, Univ. Louisville, Louisville KY
- Director, Systems Analysis Lab., Birth Defects Center
 - Member, Center for Environmental Genomics and Integrative Biology (NIEHS center)
- 8/90-12/03 Professor of Pathol. Anat. and Cell Biology, Thomas Jefferson University, Philadelphia PA
- Principal Investigator, Birth Defects Training Grant (NIEHS)
 - Taught Medical Gross Anatomy and Embryology
 - Human Embryology and Development (HED-2) study section, NIH
- 8/86-7/90 Assistant Professor of Anatomy, E. Tenn. State U., Johnson City TN
- 7/81-7/86 Postdoctoral fellow, developmental cell biology
- NRSA Postdoctoral Fellow, Emory University, Atlanta GA (Developmental Biology)
 - Research Scholar, Children's Hospital Research Foundation, Cincinnati (Cell Biology)

Education:

Ph.D., Thomas Jefferson University, Philadelphia PA (Anatomy, 1976-81)
B.S., Albright College, Reading PA (Biology, 1972-76)

Graduate Thesis Advisor for:

Michael R. Blackburn, Ph.D., 1993, thesis title: *“Characterization of an Adenosine Signaling Mechanism in the Early Postimplantation Mouse Uterus”*. Mike is Professor of Biochemistry and Molecular Biology at the University of Texas Health Sciences Center in Houston TX.

Gao Xiang, Ph.D., 1994, thesis title: *“Apoptosis in Early Mouse Embryos as a Determinant of Abnormal Development”*. Dr. Gao is Director of the Institute for Mouse Genetics, Nanjing University in China, where he currently resides.

Judith A. Wubah, Ph.D., 1999, thesis title: *“A Model for p53 Gene-Teratogen Interaction in Early Mouse Embryos”*. Judith is Assistant Professor of Biology at Virginia Tech, Blacksburg VA.

Michael F. O’Hara, Ph.D. 2002, thesis title: *“Dysregulation of Nuclear-Mitochondrial Intergenomic Control During Ocular Teratogenesis”*. Mike is a staff scientist in Safety and Profiling Assessment, Hoffman la Roche, Nutley NJ..

Jeffrey H. Charlap, M.S. 2002, thesis title: *“Toxicogenomic Analysis of Teratogenesis”*. Jeff is research scientist at Wil Research Labs, Ashland OH.

Nafeesa Hunt-Owens, Ph.D. 2004, thesis title: *“Nuclear and Mitochondrial Regulation of Cellular Differentiation: Roles of Serum Response Factor and Tumor Suppressor p53”*. Program Officer, National Science Foundation, Washington D.C.

Maia Green, M.S. 2005, thesis research: *“Altered programming of biotin carboxylases during cellular biotin deficiency”*. Maia is a Staff Scientist at Merck in West Point, PA.

Caleb D. Bastian, Dental Student, summer research on *Bayesian variable selection for analysis of gene expression data* (winner – Research!Louisville 2007). Caleb is now a PhD student at Princeton University.

Graduate Thesis Committees / postdoctoral advisor / faculty research mentor:

(1) Mayme Wong; (2) Michael Blackburn; (3) Jackie Brittingham; (4) Gao Xiang; (5) Patrick Connelly; (6) Fan Ju Lin; (7) Judith Wubah; (8) Ed Frizzell; (9) Monier Ibrahim (postdoctoral); (10) Pete Alexander; (11) Julie Kirillova; (12) Ron Donahue; (13) Michael O’Hara; (14) Jeff Charlap; (15) Gordon Strachan; (16) Chris Cifarelli; (17) Sara Crumm; (18) Marjaneh Razmara; (19) Kimberly Nemeth (postdoctoral); (20) Robert Vinson (external member, McGill University); (21) Jongwha Lee (faculty); (22) Nafeesa Hunt-Owens (pre- and postdoctoral); (23) Maia Green; (24) Amar Singh; (25) Yihzi Zhang (postdoctoral); (26) Bruno Ruest (postdoctoral); (27) Susmita Datta (faculty); (28) Nicole Kleinstreuer (postdoctoral); (29) Nisha Sipes (postdoctoral); (30) Kelly Chandler (postdoctoral); (31) Michael Rountree (student services contractor); (32) Daniel Rotroff (committee); (33) Maxwell Leung (ORISE postdoctoral); (34) Shane Hutson (ORISE faculty); (35) Bhavesh Ahir (ORISE postdoctoral); (36) Gautam Nagaraj (high-school student).

Editorships/editorial boards (current):

Embryo Today (Birth Defects Research, Part C)

Developmental Dynamics

Editor-In-Chief, *Reproductive Toxicology* (2003-present), Elsevier

Volume Editor, *Developmental Toxicology*, Elsevier's series on Comprehensive Toxicology

EPA Awards (2007-2013):

- 2009: EPA "On the Spot" Award.
- 2009: 2010 Scientific and Technological Achievement Award (STAA), Level II for "Communicating Toxicity Databases that Facilitate transparency of EPA's Evaluation of Chemical Risk to the Environment and Public Health". (Knudsen et al. 2009, "Profiling the Activity of Environmental Chemicals in Prenatal Developmental Toxicity Studies using the U.S. EPA's ToxRefDB (Reprod. Toxicol).
- 2010: EPA "S" Award – Superior Accomplishment Recognition Award for leadership and mentoring in Virtual Embryo.
- 2011: EPA "Q" Award – Quality Accomplishment Recognition Award for outstanding scientific leadership in the priority setting workplan developed for 21st Century Tools for Chemical Programs
- 2011: US EPA National Honor Award, EPA Scientific Achievement Award for Health Sciences, for outstanding accomplishment establishing a computational toxicology research program and delivering risk management solutions to EPA regulatory offices, 2010
- 2012: 2011 Scientific and Technological Achievement Award (STAA), Level III for "Rapid Assessment of Toxicity of Oil Spill Dispersants to Aid in Decision Making during the Deepwater Horizon Oil Spill". (Judson et al. 2010, Env Hlth Persp).
- 2012: ORD Bronze Medal Award for Commendable Service, for outstanding leadership in creating an atmosphere of open communication, frank discussion and smart science to implement the Chemical Safety for Sustainability Research Program.
- 2012: NCCT Bronze Medal for Commendable Service, for innovative thinking developing new reproductive, developmental, vascular and cancer models that demonstrate how ToxCast can be used to prioritize chemicals and predict potential toxicity.
- 2013: PeerOVATION Top Innovation, 2012: 'Virtual Embryo Model'.
- 2013: Recognized for outstanding scientific leadership role in the planning and implementation of 'Virtual Models for Predictive Toxicology' under the Chemical Safety for Sustainability (CSS) Research Program.
- 2013: 2012 Scientific and Technological Achievement Award (STAA), Level I for "Advancing Chemical Safety Assessment via the Development of Predictive Reproductive and Developmental Toxicity Models".

Other Awards and Honors:

Predoctoral trainee, T32 HD07075 (1977-80)
 NIH Postdoctoral trainee, F32 HD06212 (1982-85)
 Wilson Publication Award, Teratology Society (2002)
 University Scholar, University of Louisville (2003-08)
 Research!Louisville: 3rd place, Innovation in Biotechnology (2004)
 Distinguished Alumni Award (2008) Thomas Jefferson University
 Josef Warkany Lecture (2014), Teratology Society

Publications:

1. Kochhar, D.M., Penner, J.D., and **Knudsen, T.B.** (1980) Embryotoxic, teratogenic and metabolic effects of ribavirin in mice. *Toxicol. Appl. Pharmacol.* 52: 99-112.
2. **Knudsen, T.B.** and Kochhar, D.M. (1981) Limb development in mouse embryos. III. Cellular events underlying the determination of altered skeletal patterns following treatment with 5-fluoro-2'-deoxyuridine. *Teratology* 23: 241-251.
3. **Knudsen, T.B.** and Kochhar, D.M. (1981) The role of morphogenetic cell death during abnormal limb-bud outgrowth in mice heterozygous for the dominant mutation Hemimelia-extra toe (Hmx). *J. Embryol. Exp. Morph.* 65s: 289-307.
4. **Knudsen, T.B.**, Elmer, W.A., and Kochhar, D.M. (1985) Elevated rate of DNA synthesis and its correlation to cAMP-phosphodiesterase activity during induction of polydactyly in mouse embryos heterozygous for Hemimelia-extra toe (Hmx). *Teratology* 31: 155-166.
5. **Knudsen, T.B.**, Bulleit, R.F., and Zimmerman, E.F. (1985) Histochemical localization of glycosaminoglycans during morphogenesis of the secondary palate in mice. *Anat. Embryol.* 173: 137-142.
6. **Knudsen, T.B.** and Elmer, W.A. (1987) Evidence for negative control of growth by adenosine in the mammalian embryo: induction of Hmx mutant limb outgrowth by adenosine deaminase. *Differentiation* 33: 270-279.
7. Elmer, W.A., Pennybacker, M.F., **Knudsen, T.B.**, and Kwasigroch, T.E. (1988) Alterations in cell surface galactosyltransferase activity during limb chondrogenesis in brachypod mutant mouse embryos. *Teratology* 38: 475-484.
8. **Knudsen, T.B.**, Green, J.D., Airhart, M.J., Higley, H.R., Chinsky, J.M., and Kellems, R.E. (1988) Developmental expression of adenosine deaminase in placental tissues of the early postimplantation mouse embryo and uterine stroma. *Biol. Reprod.* 39: 937-951.

9. Chinsky, J.M., Ramamurthy, V., **Knudsen, T.B.**, Higley, H.R., Fanslow, W.C., Trentin, J.J., and Kellems, R.E. (1989) Developmental and tissue specific regulation of adenosine deaminase in mice. In *Gene Transfer and Gene Therapy*, Verma, I., Mulligan, R.C., and Beaudet, A.L. (eds.), New York: Alan R. Liss, Inc., pp. 255-268.
10. **Knudsen, T.B.** (1989) In vitro approaches to the study of embryonic cell death in developmental toxicity. In *In Vitro Methods in Developmental Toxicity: Use in Defining Mechanisms and Risk Parameters*, Kimmel, G.L. and Kochhar, D.M. (eds.), Boca Raton: CRC Press, Inc. pp. 129-142.
11. Ramamurthy, V., Chinsky, J.M., Shaffer, K.T., Trentin, J.J., **Knudsen, T.B.**, and Kellems, R.E. (1989) Prenatal and postnatal expression of adenosine deaminase in mice. In *Molecular and Cellular Mechanisms of Human Hypersensitivity and Autoimmunity*, Goetzl, E. (ed.), New York: Alan R. Liss, Inc., pp. 125-131.
12. **Knudsen, T.B.**, Gray, M.K., Church, J.K., Blackburn, M.R., Airhart, M.J., Kellems, R.E., and Skalko, R.G. (1989) Early postimplantation embryoletality in mice following in utero inhibition of adenosine deaminase with 2'-deoxycoformycin. *Teratology* 40: 615-626.
13. Chinsky, J.M., Ramamurthy, V., Fanslow, W.C., Ingolia, D.E., Blackburn, M.R., Shaffer, K.T., Higley, H.R., Trentin, J.J., Rudolph, F.B., **Knudsen, T.B.**, and Kellems, R.E. (1990) Developmental expression of adenosine deaminase in the upper alimentary tract of mice. *Differentiation* 42: 172-183.
14. Airhart, M.J., Roberts, M.A., **Knudsen, T.B.**, and Skalko, R.G. (1990) Axonal guidance of adenosine deaminase immunoreactive primary afferent fibers in developing mouse spinal cord. *Brain Res. Bull.* 25: 299-309.
15. Hong, L., Mulholland, J., Chinsky, J.M., **Knudsen, T.B.**, Kellems, R.E., and Glasser, S.R. (1991) developmental expression of adenosine deaminase during decidualization in the rat uterus. *Biol. Reprod.* 43: 83-93.
16. **Knudsen, T.B.**, Blackburn, M.R., Chinsky, J.M., Airhart, M.J., and Kellems, R.E. (1991) Ontogeny of adenosine deaminase in the mouse decidua and placenta: immunolocalization and embryo transfer studies. *Biol. Reprod.* 43: 171-184.
17. **Knudsen, T.B.**, Winters, R.S., Otey, S.K., Blackburn, M.R., Airhart, M.J., Church, J.K., and Skalko, R.G. (1992) Effects of (R)-deoxycoformycin (pentostatin) on intrauterine nucleoside catabolism and embryo viability in the pregnant mouse. *Teratology* 45: 91-103.
18. Kwasigroch, T.E., Curtis, S.K., **Knudsen, T.B.**, Barrach, H-J., and Elmer, W.A. (1992) Morphological analysis of abnormal digital chondrogenesis in the brachypod (bph) mouse limb in organ culture. *Anat. Embryol.* 185: 307-315.

19. Blackburn, M.R., Gao, X., Airhart, M.J., Skalko, R.G., Thompson, L.F., and **Knudsen, T.B.** (1992) Adenosine levels in the early postimplantation mouse uterus. Quantitative analysis by HPLC-fluorometric detection and spatio-temporal regulation by 5'-nucleotidase and adenosine deaminase. *Devel. Dynam.* 194: 155-168.
20. Airhart, M.J., Robbins, C.M., **Knudsen, T.B.**, Church, J.K., and Skalko, R.G. (1993) The occurrence of abnormalities in mouse embryos following in utero exposure to 2'-deoxycoformycin (pentostatin). *Teratology* 47: 17-27.
21. Resta, R., Hooker, S.W., Hansen, K.R., Laurent, A.B., Park, J.L., Blackburn, M.R., **Knudsen, T.B.**, and Thompson, L.F. (1993) Murine ecto-5'-nucleotidase (CD73): cDNA cloning and tissue distribution. *Gene* 133: 171-177.
22. Gao, X., Blackburn, M.R., and **Knudsen, T.B.** (1994) Activation of apoptosis in early mouse embryos by 2'-deoxyadenosine exposure. *Teratology* 48: 1-12.
23. Gao, X., **Knudsen, T.B.**, Ibrahim, M.M. and Haldar, S. (1995) Bcl-2 relieves deoxyadenylate stress and suppresses apoptosis in Pre-B leukemia cells. *Cell Death Different.* 2: 69-78.
24. Puffinbarger, N.K., Hansen, K.R., Resta, R., Laurent, A.B., **Knudsen, T.B.**, Madara, J.L. and Thompson, L.F. (1995) Production and characterization of multiple antigenic peptide antibodies to the adenosine A2b receptor. *Mol. Pharmacol.* 47: 1126-1132.
25. Ibrahim, M.M., I.T.Weber, and **Knudsen, T.B.** (1995) Mutagenesis of human adenosine deaminase to active forms that partially resist inhibition by pentostatin. *Biochem. Biophys. Res. Commun.* 209: 407-416.
26. **Knudsen, T.B.** (1996) Cell death. In *Drug Toxicity in Embryonic Development*, Kavlock R.J. and Daston, G.P. (eds.), New York: Springer-Verlag, pp. 211-244.
27. **Knudsen, T.B.** (1996) Cellular techniques for teratological cell death. In *Molecular and Cellular Methods in Developmental Toxicology*, Daston, G.P. (ed.), Boca Raton: CRC Press, Inc., pp 183-193.
28. Hanson, J.W., Harris, C., Holmes, L.B., Juchau, M.R., Kimmel, G.L., **Knudsen, T.B.**, Mirkes, P.E., Sadler, T.W., Schoenwolf, G.C., and Sulik, K.K. (1996) A teratologist to extinction. *Ad Hoc Committee on grant funding (Letters, comment).* *Teratology* 53: 223-224.
29. Wubah, J.A., Ibrahim, M.M., Gao, X., Nguyen, D., Pisano, M.M., and **Knudsen, T.B.** (1996) Teratogen-induced eye defects mediated by p53-dependent apoptosis. *Current Biology* 6:60-69.
30. Airhart, M.J., Robbins C.M., **Knudsen, T.B.**, Church, J.K., and Skalko, R.G. (1996) The developing allantois is a primary site of 2'-deoxycoformycin toxicity. *Teratology* 53:361-373.

31. Resta R., Hooker S.W., Laurent A.B., Rahman S.M.J., Franklin M., **Knudsen, T.B.**, Nadon N.L., and Thompson L.F. (1997) Insights into thymic purine metabolism and adenosine deaminase deficiency revealed by transgenic mice overexpressing ecto-5'-nucleotidase (CD73). *J. Clin. Invest.* 99: 676-683.
32. Blackburn, M.R., **Knudsen, T.B.**, and Kellems, R.E. (1997) Genetically engineered mice demonstrate that adenosine deaminase is essential for early postimplantation development. *Development* 124: 3089-3097.
33. **Knudsen, T.B.** (1997) Genetic and Cellular Pathways in Teratogen-Induced Cell Death. In *Comprehensive Toxicology* (Vol. 10), Sipes, I.G., McQueen, C.A., and Gandolfi A.J. (eds.), New York: Pergamon, pp. 529-534.
34. **Knudsen, T.B.** and Wubah, J.A. (1998) Transgenic animal models. Functional analysis of developmental toxicity as illustrated with the p53 suppressor model. In *Handbook of Developmental Neurotoxicology*, Slikker, W. Jr. and Chang, L.W. (eds.), San Diego: Academic Press, pp 209-221.
35. Ibrahim, M.M., Razmara, M., Nguyen D., Donahue R.J., Wubah J.A., and **Knudsen, T.B.** (1998) Altered expression of mitochondrial 16S ribosomal RNA in p53-deficient mouse embryos revealed by differential display. *Biochem. Biophys. Acta* 1403: 254-264.
36. Blackburn, M.R., Wubah, J.A., Thompson, L.F., and **Knudsen, T.B.** (1999) Transitory expression of the A2b adenosine receptor during implantation chamber development. *Devel. Dynam.* 216: 127-136.
37. **Knudsen, T.B.** (1999) HPLC-based mRNA differential display. In: *Developmental Biology Protocols* (vol. II), Tuan, R.S. and Lo, C.W. (eds.). Totowa: Humana Press, Inc., pp 337-341.
38. Lau, C., Andersen, M.E., Crawford-Brown, D.J., Kavlock, R.J., Kimmel, C.A., **Knudsen, T.B.**, Muneoka, K., Rogers, J.M., Setzer, R.W., Smith, G., and Tyl, R. (1999) Evaluation of biologically based dose-response modeling for developmental toxicity: a workshop report. *Reg Toxicol Pharmacol* 31: 190-199.
39. Knudsen T.B. (2000) Mitochondrial transduction of teratogenesis. *Teratology* 62: 238-239.
40. Donahue R.J., Razmara, M., Hoek, J.B. and **Knudsen, T.B.** (2001) Direct influence of the p53 tumor suppressor on mitochondrial biogenesis and function. *FASEB J* 15: 635-644.
41. Wubah, J.A., Setzer, R.W., Lau, C., Charlap, J.H., and **Knudsen, T.B.** (2001) Exposure-disease continuum for 2-chloro-2'-deoxyadenosine, a prototype ocular teratogen. I. Dose-response analysis. *Teratology* 64: 154-169.
42. O'Hara, M.F., Charlap, J.H., Craig, R.C., and **Knudsen, T.B.** (2002) Mitochondrial transduction of ocular teratogenesis during methylmercury exposure. *Teratology* 65:131-144.

43. Lau C., Narotsky M.G., Lui, D., Best, D., Setzer, R.W., Mann, P.C., Wubah, J.A. and **Knudsen, T.B.** (2002) Exposure-disease continuum for 2-chloro-2'-deoxyadenosine, a prototype teratogen. II. Induction of lumbar hernia in the rat and species comparison for the teratogenic responses. *Teratology* 66: 6-18.
44. Charlap, J.C., Donahue, R.J., and **Knudsen, T.B.** (2003) Exposure-disease continuum for 2-chloro-2'-deoxyadenosine, a prototype ocular teratogen. 3. Intervention with PK11195. *Birth Defects Research (Part A)* 67: 108-115.
45. O'Hara, M.F., Nibbio, B.J., Craig, R.C., Nemeth, K.R., Charlap, J.H., and **Knudsen, T.B.** (2003) Mitochondrial benzodiazepine receptors regulate oxygen homeostasis in the early mouse embryo. *Reprod. Toxicol.* 17: 365-375.
46. **Knudsen, T.B.**, Charlap, J.H., and Nemeth, K.R. (2003) Microarray applications in developmental toxicology. In: *Perspectives in Gene Expression*. K. Appasani, ed. Eaton Publishing/BioTechniques Press, Westboro MA. Chapter 10, pp 173-194.
47. Lee, J.w., Park, J., Jang, B., and **Knudsen, T.B.** (2004) Altered Expression of Genes Related to Zinc Homeostasis in Early mouse Embryos Exposed to Di-2-ethylhexyl phthalate. *Toxicol Ltr* 152: 1-10.
48. **Knudsen, T.B.** and Green, M.L. (2004) Response characteristics of the mitochondrial DNA (mtDNA) genome in developmental health and disease. *Birth Defects Research (Part C)* 72: 313-329.
49. Singh, A.V., Knudsen, K.B., and **Knudsen, T.B.** (2005) Computational systems analysis of developmental toxicity: design, development and implementation of a birth defects systems manager (BDSM). *Reprod Toxicol* 19: 421-439.
50. Nemeth, K.A., Singh, A.V., and **Knudsen, T.B.** (2005) Searching for biomarkers in developmental toxicity with microarrays: normal eye morphogenesis in rodent embryos. *Toxicol. Appl. Pharmacol.* 206: 219-228.
51. **Knudsen, T.B.** (2005) How can we use bioinformatics to predict which agents will cause birth defects? In: *Primer in Teratology* (B. Hales and A. Scialli, eds) Teratology Society. Chapter 20, pp- 58-59.
52. Szabo G., Hoek, J.B., Darley-Usmar, V., Hajnoczky, G., **Knudsen, T.B.**, Mochly-Rosen, D., and Zakhari, S. (2005) RSA 2004: Combined basic research satellite symposium – session three: Alcohol and Mitochondrial Metabolism: AT the crossroads of life and death. *Alcoh. Clin. Exp. Res.* 29: 1749-1752.
53. Knudsen, K.B., Singh, A.V. and **Knudsen, T.B.** (2005) Data input module for Birth Defects Systems Manager. *Reprod. Toxicol.* 20: 369-375.

-
54. Slikker, W. Jr., Young, J.F., Corley, R.A., Dorman, D.C., Conolly, R.B., **Knudsen, T.B.**, Erstad, B.L., Luecke, R.H., Faustman, E.M., Timchalk, C., and Mattison, D.R. (2005) Improving predictive modeling in pediatric drug development: pharmacokinetics, pharmacodynamics and mechanistic modeling. *Ann. N.Y. Acad. Sci.* 1053: 505-518.
55. Kinane D.F., Shiba H., Stathopoulou P.G., Zhao H., Lappin D.F., Singh A.V., Eskin M.A., Beckers S., Weigel S., Alpert B. and Knudsen T.B. (2006) Gingival epithelial cells heterozygous for Toll-like receptor 4 polymorphisms Asp299Gly and Thr399Ile are hypo-responsive to *Porphyromonas gingivalis*. *Genes and Immunity* 7: 190-200.
<http://www.nature.com/doi/10.1038/sj.gene.6364282>.
56. Papadopoulos V., Baraldi M., Guilarte T.R., Knudsen T.B., Lacapère J.J., Lindemann P., Norenberg M.D., Nutt D., Poupon M.F., Weizman A., Zhang M.R. and Gavish M. (2006) TSPO: New Nomenclature for the peripheral-type Benzodiazepine receptor / recognition Site (PBR) based on its structure and molecular function. *Trends in Pharmacol Sci* 8: 402-409.
57. Green M.L., Singh A.V., Zhang Y., Nemeth K.A., Sulik K.K., and Knudsen T.B. (2007) Reprogramming of genetic networks during initiation of the Fetal Alcohol Syndrome. *Developmental Dynamics* 236: 613-631.
58. Singh A.V., Knudsen K.B. and Knudsen T.B. (2007) Integrative Analysis of the mouse embryonic transcriptome. *Bioinformatics* 1: 24-30.
59. Singh A.V., Rouhka E.C., Rempala G.A., Bastian C.D. and Knudsen T.B. (2007) Integrative database management for mouse development: systems and concepts. *Birth Defects Res (Part C)*: 81: 1-19.
60. Calabrese E.J., Bailer J., Bachmann K.A., Bolger P.M., Borak J., Cai L., Cedergreen N., Chiueh C.C., Cherian M.G., Clarkson T.W., Cook R.R., Diamond D.M., Doolittle D.J., Dorato M.A., Duke S.O., Feinendegen L., Gardner D.E., Hart R.W., Hastings K.L., Hayes A.W., Hoffman G.R., Jaworowski Z., Johnson T.E., Keller J.G., Klaunig J.E., **Knudsen T.B.**, Kozumbo W.J., Lettieri T., Liu S-Z., Maisseu A., Maynard K., Masoro E.J., Mothersil C., Newlin D.B., Oehme F.W., Phalen R.F., Philbert M.A., Rattan S.I.S., Riviere J.E., Rodricks J., Sapolsky R.M., Scott B.R., Seymour C., Smith-Sonneborn J., Snow E.T., Spear L., Stevenson D.E., Thomas Y., Williams G.M. and Mattson M.P. (2007) Biological Stress Response Terminology: Integrating the concepts of adaptive response and preconditioning stress within a hormetic dose-response framework. *Toxicol Appl Pharmacol* 222: 122-128.
61. Deaciuc IV, Song Z, Peng X, Barve SS, Song M, He Q, **Knudsen TB**, Singh AV, and McClain CJ (2008) Genome-wide transcriptome expression in the liver of a mouse model of high carbohydrate diet-induced liver steatosis and its significance for the disease. *Hepatol. International* 2: 39-49.

-
62. Barthold JS, McCahan, Singh AV, **Knudsen TB**, Si X, Campion L and Akins RE (2008) Altered expression of muscle and cytoskeleton-related genes in a rat strain with inherited cryptorchidism. *J. Androl.* 29: 352-366.
63. Datta S, Turner D, Singh R, Ruest LB, Pierce WM Jr and **Knudsen TB** (2008) Fetal Alcohol Syndrome (FAS) in C57BL/6 mice detected through proteomics screening of the amniotic fluid. *Birth Defects Res (Part A)* 82: 77-86.
64. **Knudsen TB** and Kavlock RJ (2008) Comparative bioinformatics and computational toxicology. In: *Developmental Toxicology 3rd edition*. (B Abbott and D Hansen, editors) New York: Taylor and Francis, Chapter 2, pp 3-360.
65. Benakanakere MR, Li Q, Eskin MA, Singh AV, Galicia JC, Stathopoulou P, **Knudsen TB** and Kinane DF (2009) MicroRNA-05 modulates TLR-2 responses in oral keratinocytes. *J Biol Chem* 284: 23107-23115.
66. **Knudsen TB**, Martin NT, Kavlock RJ, Judson RS, Dix DJ and Singh AV (2009) Profiling the Activity of Environmental Chemicals in Prenatal Developmental Toxicity Studies using the U.S. EPA's ToxRefDB. *Reproductive Toxicology* 28: 209-219.
67. Daston GP and **Knudsen TB** (2010) Fundamental concepts, current regulatory design and interpretation in developmental toxicology. In: *Comprehensive Toxicology: Developmental Toxicology* (editors: GP Daston and TB Knudsen), Elsevier: New York. pp 3-9.
68. **Knudsen TB** and Daston GP (2010) Virtual Tissues and Developmental Systems Biology. In: *Comprehensive Toxicology: Developmental Toxicology* (editors: GP Daston and TB Knudsen), Elsevier: New York. pp 347-358.
69. Ema M, Iseb R, Katoc H, Onedad S, Hirosea A, Hirata-Koizumia M, Nishidac Y, Singh AV, **Knudsen TB** and Ihara T (2010) Fetal malformations and early embryonic gene expression response in cynomolgus monkeys maternally exposed to thalidomide. *Reproductive Toxicology* 29: 49-56. (ETS publication award, 2011).
70. Judson RS, Houck KA, Kavlock RJ, **Knudsen TB**, Martin MT, Mortensen HM, Reif DM, Richard AM, Rotroff DM, Shah I and Dix DJ (2010) Predictive in vitro screening of environmental chemicals – the ToxCast project. *Env Hlth Persp.* 118: 485-492.
71. **Knudsen TB** (2010) Can Computational Models Be Used To Assess The Developmental Toxicity of Environmental Exposures? In "Teratology Primer, Second Edition" (B Hales, A Scialli, M Tassinari, eds.) Published (online) by the Teratology Society. <http://connection.teratology.org/p/cm/ld/fid=6>
72. **Knudsen TB** and Kochhar DM (2010) The Hemimelic extra toes (Hx) Mouse Mutant: historical perspective on unraveling mechanisms of dysmorphogenesis. *Birth Defects Res C* 90:155-162.

-
73. Judson RS, Martin MT, Reif DM, Houck KA, **Knudsen TB**, Rotroff DM, Xia M, Sakamuru S, Huamng R, Shinn P, Austin CP, Kavlock RJ and Dix DJ (2010) Analysis of Eight Oil Spill Dispersants Using Rapid, In Vitro Tests for Endocrine and Other Biological Activity, *Environ Sci Technol* 44: 5879-5985.
74. Reif D, Martin M, Tan S, Houck K, Judson R, Richard A, **Knudsen T**, Dix D and Kavlock R (2010) Endocrine Profiling and Prioritization of Environmental Chemicals Using ToxCast Data. *Environ Hlth Persp* 118: 1714-1720.
75. **Knudsen TB** and DeWoskin R (2011) Systems modeling in developmental toxicity. In: "Handbook of Systems Toxicology", Edited: Daniel A. Casciano and Saura C. Sahu, John Wiley & Sons Limited Chichester, UK. (Chapter 37) pp 599-617.
76. **Knudsen TB**, Houck K, Sipes NS, Judson RS, Singh AV, Weissman A, Kleinstreuer NC, Mortensen H, Reif D, Setzer RW, Martin MT, Richard A, Dix DJ, and Kavlock RJ (2011) Activity profiles of 320 ToxCast™ chemicals evaluated Across 292 biochemical targets. *Toxicology* 282: 1-15.
77. Judson RS, Dix DJ, Kavlock RJ, Setzer RW, Cohen Hubal EA, Martin MT, **Knudsen TB**, Houck KA, Thomas RS, and Wetmore BA (2011) Estimating Toxicity-Related Biological Pathway Altering Doses for High-Throughput Chemical Risk Assessment. *Chem Res Toxicol*. 24: 451-462.
78. Chandler KJ , Barrier M, Jeffay S, Nichols H, Kleinstreuer N, Singh A, Reif D, Sipes N, Judson R, Dix D, Kavlock R, Hunter S and **Knudsen T** (2011) Evaluation of 309 environmental chemicals using a mouse embryonic stem cell adherent cell differentiation and cytotoxicity assay. *PLoS One*. 6(6): e18540.
79. Martin MT, **Knudsen TB**, Reif DM, Houck KA, Judson RS, Kavlock RJ and Dix DJ (2011) Predictive model of reproductive toxicity from ToxCast high throughput screening. *Biol Reprod*. 85: 327-339.
80. Sipes NS, Padilla S and **Knudsen TB** (2011) Zebrafish – as an Integrative Model for 21st Century Toxicity Testing. *Birth Defects Res C* 93: 256-267.
81. Sipes NS, Kleinstreuer NC, Judson RS, Reif DM, Martin MT, Singh AV, Rountree MR, Dix DJ, Kavlock RJ and **Knudsen TB** (2011) Predictive models of prenatal developmental toxicity from ToxCast high-throughput screening data. *Toxicol Sci* 124: 109-127.
82. **Knudsen TB**, Kavlock RJ, Daston GP, Stedman D, Hixon M, and Kim J (2011) Developmental Toxicity Testing for Safety Assessment: New Approaches and Technologies. *Birth Defects Res (Part B)* 92: 413-420.
83. Kleinstreuer N, Judson R, Reif D, Sipes N, Singh A, Chandler KJ, DeWoskin R, Dix D, Kavlock R and **Knudsen TB** (2011) Environmental Impact on Vascular Development Predicted by High-Throughput Screening (HTS). *Env Health Persp*. 119: 1596-1603.

-
84. Kleinstreuer NC, West PR, Weir-Hauptman AM, Smith AM, **Knudsen TB**, Donley ELR and Cezar GG (2011) Predicting Developmental Toxicity of ToxCast Phase I Chemicals Using Human Embryonic Stem Cells and Metabolomics. *Toxicol Appl Pharmacol* 257: 111-121.
85. Green ML, Pisano MM, Prough RL, Singh AV and **Knudsen TB** (2011) Differential programming of p53 during rotenone-induced mitochondrial dysfunction. *Toxicology* 290: 31-41.
86. Judson RS, Mortensen H, Shah I, **Knudsen T** and Elloumi F (2011) Using Pathway Modules as Targets for Assay Development in Xenobiotic Screening. *Molecular BioSystems* 8: 531-542.
87. Hartung T, Blaauboer BJ, Bosgra S, Carney E, Coenen J, Conolly RB, Corsini E, Green S, Faustman EM, Gaspari A, Hayashi M, Hayes AW, Hengstler JG, Knudsen LE, **Knudsen TB**, McKim JM, Pfaller W and Roggen EL (2011) An Expert Consortium Review of the EC-commissioned Report "Alternative (Non-Animal) Methods for Cosmetics Testing: Current Status and Future Prospects – 2010". *ALTEX* 28: 183-209.
88. **Knudsen TB** and Kleinstreuer NC (2011) Disruption of embryonic vascular development in predictive toxicology. *Birth Defects Res C* 93: 312-323.
89. Kleinstreuer NC and **Knudsen TB** (2011) Predictive Modeling and Computational Toxicology. In: *Developmental and Reproductive Toxicology, A Practical Approach, Third Edition* (Ed: Ronald D. Hood), Informa Healthcare, London, UK. (Chapter 23) pp 578-591.
90. Martin MT, **Knudsen TB**, Judson RS, Kavlock RJ and Dix DJ (2012) Dashboard for Reproductive Toxicity Testing and Decision-Making. *Systems Biol Reprod Med*. 58: 3-9.
91. Basketter DA, Clewell H, Kimber I, Rossi A, Blaauboer B, Burrier R, Daneshian M, Eskes C, Goldberg A, Hasiwa N, Hoffmann S, Jaworska J, **Knudsen TB**, Landsiedel R, Leist M, Locke P, Maxwell G, McKim J, McVey EA, Ouédraogo G, Patlewicz G, Pelkonen O, Roggen E, Rovida C, Ruhdel I, Schwarz M, Schepky A, Schoeters G, Skinner N, Trentz K, Turner M, Vanparys P, Yager J, Zurlo J and Hartung T (2012) t4 Report: A roadmap for the development of alternative (non-animal) methods for systemic toxicity testing. *ALTEX* 29: 3-91.
92. Padilla S, Corum D, Padnos B, Hunter DL, Beam A, Houck KA, Sipes NS, Kleinstreuer NC, **Knudsen TB**, Dix DJ, and Reif DM (2012) Zebrafish Developmental Screening of the ToxCast™ Phase I Chemical Library. *Reprod Toxicol*. 33: 174-187.
93. States JC, Singh AV, **Knudsen TB**, Rouchka EC, Ngalame NO, Arteel GE, Piao Y and Ko MS (2012) Prenatal arsenic exposure alters gene expression in the adult liver to a proinflammatory state contributing to accelerated atherosclerosis. *PLoS one* 7(6):e38713. Epub2012 Jun15.

94. Barrier M, Chandler K, Jeffay S, Hoopes M, **Knudsen T** and Hunter S (2012) Mouse Embryonic Stem Cell Adherent Cell Differentiation and Cytotoxicity (ACDC) assay. Chapter, Springer Protocols (Humana Press) Methods in Molecular Biology – Developmental Toxicology (Eds: J Hansen and C Harris). Vol 889, pp 181-195.
95. Kavlock R, Chandler K, Dix D, Houck K, Hunter S, Judson R, Kleinstreuer N, **Knudsen T**, Martin M, Padilla S, Reif D, Richard A, Rotroff D and Sipes N (2012) Update on EPA's ToxCast program: providing high throughput decision support tools for chemical risk management. Chemical Res Toxicol. 25: 1287-1302.
96. **Knudsen T**, Martin M, Chandler K, Kleinstreuer N, Judson R and Sipes N (2012) Predictive Models and Computational Toxicology. In: Teratogenicity Testing: Methods and Protocols. Edited: P Barrow, Humana Press, New York. Chapter 26, pp 343-374.
97. Rotroff DM, Dix DJ, Houck KA, **Knudsen TB**, Martin MT, McLaurin KL, Reif DM, Crofton KM, Singh AV, Xia M, Huang R and Judson RS (2012) Using in vitro high-throughput screening assays to identify potential endocrine disrupting chemicals. Environ Hlth Persp. 121: 7-14.
98. Luijten M, Singh AV, Bastian CD, Verhoef A, Westerman A, Pisano MM, Schipper MA, Dollé ME, Verhoef A, Green ML, Piersma AH, de Vries A, Green ML and **Knudsen TB** (2012) Lasting effects on body weight and mammary gland gene expression in female mice upon early life exposure to n-3 but not n-6 high-fat diets PLoS One 8(2):e55603. doi: 10.1371/journal.pone.0055603.
99. Solecki R Barbellion S, Bergmann B, Bürgin H, Buschmann J, Clark R, Comotto L, Fuchs A, Faqi A, Gerspach , R, Grote K, Hakansson H, Hofmann T, Hübel U, Inazaki TH, Khalil S, **Knudsen TB**, Lingk W, Kudicke S, Makris S, Müller S, Paumgartten F, Roma EM, Schneider S, Shiota K, Tamborini E, Tegelenbosch M, Tiramani M, Ulbrich B, van Duijnhoven EAJ, Wise D and Chahoud I (2013) Harmonization of description and classification of fetal observations: Achievements and still standing problems. Reprod Toxicol. 35: 48-55.
100. Kleinstreuer NC, Dix DJ, Houck KA, Kavlock RJ, **Knudsen TB**, Martin MT, Reif DM, Crofton KM, Hamilton K, Hunter R, Paul KB, Shah I and Judson RS (2013) In vitro perturbation of cancer hallmark processes is associated with rodent chemical carcinogenesis. Toxicol Sci. 131: 40-55.
101. Kleinstreuer N, Dix D, Rountree M, Baker N, Sipes N, Reif D, Spencer R, and **Knudsen T** (2013) A computational model predicting disruption of blood vessel development. PLoS Comput Biol 9(4): e1002996. doi:10.1371/journal.pcbi.1002996.
102. Allard P, Kleinstreuer N, **Knudsen T** and Colaiácovo MP (2013) A novel chemical screening strategy for assessing environmental germline disruption in *C. elegans*. Env Hlth Persp 121: 717-724.

103. Sipes NS, Martin MT, Kothiya P, Reif DM, Judson R, Richard A, Houck KA, Dix DJ, Kavlock RJ and **Knudsen TB** (2013) Profiling 976 ToxCast chemicals across 331 enzymatic and receptor signaling assays *Chem Res Toxicol* 26: 878-895.
104. Green ML, Pisano MM, Prough RL and **Knudsen TB** (2013) Release of targeted p53 from the mitochondrion as an early signal during mitochondrial dysfunction. *Cell Signaling* 25: 2383-2390.
105. Rotroff DM, Houck KA, **Knudsen TB**, Sipes NS, Martin MT, Reif DM, Abassi Y, Jin C, Stampfl M and Judson RS (2013) Using Real-Time Growth Kinetics to Measure Hormone Mimicry for 1816 Unique ToxCast Chemicals using T47D Human Ductal Carcinoma Cells. *Chem Res Toxicol* 26: 1097-1107.
106. Wambaugh JF, Reif D, Gangwal S, Mitchell-Blackwood J, Arnot J, Joliet O, Judson R, **Knudsen T**, Egeghy P, Rabinowitz J, Vallero D, Setzer RW, and Cohen-Hubal E (2013) Simulation of environmental chemical fate for exposure prioritization in the ExpoCast project. *Env Sci & Technol* 47: 8479-8488.
107. Judson R, Kavlock R, Martin M, Reif D, Houck K, **Knudsen T**, Richard A, Tice R, Whelan M, Xia M, Huang R, Austin C, Daston G, Hartung T, Fowle J, Wooge W, Tong W, and Dix D. (2013) Perspectives on validation of high-throughput pathway-based assays supporting the 21st Century toxicity testing vision. *ALTEX* 30: 51-66.
108. Hao R, Bondesson M, Singh AV, **Knudsen TB**, Gorelick DA and Gustafsson J-A (2013) Distinct sets of genes, but similar biological pathways, are regulated by estrogen during zebrafish development. *PLoS ONE* 8(11): e79020. doi:10.1371/journal.pone.0079020.
109. Kleinstreuer N, Yang J, Berg E, **Knudsen T**, Richard A, Martin M, Reif D, Judson R, Polokoff M, Kavlock R, Dix D and Houck K (2014) Phenotypic screening of the ToxCast chemical library to classify toxic and therapeutic mechanisms. *Nature Biotech* 32: 583-591.
110. Rotroff D, Matthew M, Dix D, Filer D, Houck K, **Knudsen T**, Sipes N, Reif D, Menghang X, Huang R, and Judson R (2014) Predictive endocrine testing in the 21st century using in vitro assays of estrogen receptor signaling responses. *Environ Sci Technol* 48: 8706-8716.
111. Tal TL, McCollum CW, Harris PS, Olin J, Kleinstreuer N, Wood CE, Hans C, Shah S, Merchant FA III, Bondesson M, **Knudsen TB**, Padilla S and Hemmer MJ (2014) Immediate and long-term consequences of vascular toxicity during zebrafish development. *Reprod Toxicol* 48: 51-61.
112. deWoskin RS, Shah I and **Knudsen TB** (2014) Virtual Models (vM) in Toxicology. *Encyclopedia of Toxicology*, 3rd Edition (P Wexler, Editor), 4896 pages. Elsevier, inc. pp 948-957.
113. Judson R, Houck K, Martin M, Knudsen T, Thomas RS, Sipes N, Shah I, Wambaugh J and Crofton K (2014) In Vitro and Modeling Approaches to Risk Assessment from the U.S. Environmental Protection Agency ToxCast Program. *Basic & Clin Pharmacol Toxicol* 115: 69-76.

114. Krewski D, Andersen M, Boekelheide K, Bois F, Burgoon L, Chiu W, DeVito M, El-Masri H, Flowers L, Goldsmith M, Hattis D, Knight D, **Knudsen T**, Lefew W, Paoli G, Perkins E, Rusyn I, Tan C, Teuschler L, Thomas R, Whelan M, Zacharewski T, Zeise L, and Cote I (2014) Advanced Approaches to Recurring Issues in Risk Assessment. In: "Next Generation Risk Assessment: Incorporation of Recent Advances in Molecular, Computational, and Systems Biology. Final Report." EPA/600/R-14/004. pp 94-110.
115. Leist M, Hasiwa N, Rovida C, Daneshian M, Basketter D, Kimber I, Clewell H, Gocht T, Goldberg A, Busquet F, Rossi A-M, Schwarz M, Stephens M, Taalman R, **Knudsen TB**, McKim J, Harris G, Pamies D, and Hartung T (2014) Consensus report on the future of animal-free systemic toxicity testing. ALTEX 31: 341- 356.
116. **Knudsen TB**, Keller DA, Sander M, Carney EW, Doerrner NG, Eaton DL, Fitzpatrick SC, Hastings KL, Mendrick DL, Tice RR, Watkins PB and Whelan M (2015) FutureTox II: In vitro data and in silico models for predictive toxicology. Toxicol Sci 143: 256-267.
117. Shah I, Setzer RW, Jack J, Houck KA, **Knudsen TB**, Martin MT, Reif DM, Richard AM, Dix DJ and Kavlock RJ (2015) Elucidating dynamic modulation of cellular state function during chemical perturbation (*submitted*).
118. Leung MCK, Phuong J, Baker NC, Sipes NS, Klinefelter GR, Martin MT, McLaurin K, Setzer RW, , Martin MT, Perreault-Darney S, Judson RS and **Knudsen TB** (2015) Systems Toxicology of Male Reproductive Development: Profiling 774 Chemicals for Molecular Targets and Adverse Outcomes (*submitted*).
119. Solecki, R, Rauch M, Gall A, Buschmann J, Clark R, Fuchs A, Kan H, Kellner R, Knudsen TB, Li W, Makris S, Ooshima Y, Paumgartten F, Piersma AH, Schönfelder G, Oelgeschläger M, Schäfer C, Shiota K, Ulbrich B, Xuncheng D and Chahoud I (2014) Continuing international harmonisation of the terminology used in the assessment of findings in developmental toxicology Report of the International Symposium on Developmental Toxicity (including the 8th Berlin Workshop on DevTox Terminology). Berlin, 14-16 May 2014 (*submitted*).

Manuscripts in preparation:

120. Judson R, Magpantay FM, Chickarmane V, Haskell C, Tania N, Taylor J, Xia M, Huang R, Rotroff D, Filer DM, Houck KA, Martin MT, Sipes N, Richard AM, Mansouri K, Setzer RW, **Knudsen T**, Crofton KM, Thomas RS (2015) Integrated Model of Chemical Perturbations of a Biological Pathway Using 18 In Vitro High Throughput Screening Assays for the Estrogen Receptor. (*in preparation*).
121. Judson R, Houck K, Martin M, Richard AM, **Knudsen TB**, Shah I, Little S, Wambaugh J, Setzer RW, Kothya P, Phuong J, Filer D, Smith D, Reif D, Rotroff D, Kleinstreuer N, Sipes N, Xia M, Huang R,

Crofton K and Thomas RS (2015) In Vitro Analysis of 1063 Environmentally Relevant Chemicals in a Battery of 821 assay endpoints: ToxCast Phase II (*in preparation*).

122. Ellis-Hutchings RG, Settivari RS, McCoy AT, Kleinstreuer NC, Franzosa J, **Knudsen TB**, and Carney EW (2015) Embryonic vascular disruption adverse outcomes: linking high throughput signaling signatures with functional consequences (*in preparation*).
123. Franzosa JA, Settivari RS, Ellis-Hutchings RG, Kleinstreuer NC, Houck KA, Carney EW and **Knudsen TB** (2015) RNA-Seq analysis of the functional-link between vascular disruption and adverse developmental consequences (*in preparation*).
124. DeWoskin RS, Ahir BK, Rountree MR, Spencer RM, Baker NC, Hunter ES III, Glazier JA and **Knudsen TB** (2015) Quantitative Modeling of the Spatial-Temporal Dynamics in Early Limb-Bud Outgrowth (*in preparation*).
125. Ahir B, Rountree MR, DeWoskin RS, Baker NC, Spencer RM, Setzer RW, Lau C, Glazier J and **Knudsen TB** (2014) Developmental toxicity Simulated in a dynamic virtual embryo model of early limb-bud outgrowth (*in preparation*).
126. Leung MC, Sipes NS, Baker NC, Wolf CJ, Abbott BA, Seifert AW, Hutson MS, Darney SP, Spencer RM and **Knudsen TB** (2015) Computational embryology and predictive toxicology of hypospadias (*in preparation*).

Internal Reports (EPA):

1. The ORD Future of Toxicology Working Group, “The U.S. Environmental Protection Agency’s Strategic Plan for Evaluating the Toxicity of Chemicals” (2009).
2. Draft Report of EU-US Workshop on Virtual Tissues (2010).
3. ORD lead, OCSPP “21st Century Tools for Chemical Programs. Implementing Computational Toxicology Tools for Priority Setting and Targeted Testing: TSCA21, OW21, and OPP21 case studies” (2011).
4. Next Generation Risk Assessment: Incorporation of Recent Advances in Molecular, Computational, and Systems Biology. EPA/600/R-14/004. (2014).

Invited Presentations (Selected from 126 total):

1. Keynote address, “Recent Developments in Apoptosis Research”, Teratology meetings, Palm Beach FL (1997)

2. Invited speaker, 1998 symposium of the Integrated Toxicology Program, Duke University Durham NC (1998)
3. Invited speaker, "Mitochondrial Transduction of Teratogenesis: Role of p53 and Bzrp genes", NIH/NIEHS Symposium on oxidative stress and apoptosis, Teratology meetings, Keystone CO (1999)
4. Invited speaker, "Mitochondrial Transduction of Teratogenesis", symposium on the Approaches to Normal and Abnormal Genetics, co-sponsored by the European Teratology Society and Developmental Pathology Society, Oxford UK (1999)
5. Symposium speaker, "Fluorescent cDNA microarray hybridization reveals multigenic responses of the mouse embryo to methylmercury exposure", symposium on genomics, proteomics, bioinformatics, and developmental toxicology in the 21st century, Teratology Society satellite session, Palm Beach FL (2000)
6. Invited speaker, "Mitochondrial Transduction of Teratogenesis", Children's Hospital Research Foundation, Cincinnati OH (2001)
7. Seminar speaker, "Microarray Analysis of Developmental Toxicity", PerkinElmer Biomics Guest Speaker Series, Boston MA (2001)
8. Symposium speaker, "Microarray Analysis of Developmental Toxicity", DGPT sponsored meeting on Molecular Mechanisms in Developmental Toxicology, Mainz, Germany (2002)
9. Seminar speaker, "Microarray Analysis of Developmental Toxicity", Bristol-Meyers-Squibb Research Series, Princeton NJ (2002)
10. Invited speaker, "Microarray Analysis of Developmental Toxicity", NIEHS/ACC/EPA sponsored meeting on Developmental Toxicology in the 21st Century: multidisciplinary approaches using model organisms and genomics, Research Triangle Park NC (2002)
11. Seminar speaker, "Microarray Analysis of Developmental Toxicity", A.I. duPont Children's Hospital, Wilmington DE (2002)
12. Symposium speaker, "Microarray Applications in Teratology", European Teratology Society, Hannover, Germany (2002)
13. Seminar speaker, "Understanding Birth Defects through Functional Genomics and Related Technologies", Oklahoma Medical Research Foundation, Oklahoma City OK (2002)

14. Guest speaker, "Understanding Birth Defects through Functional Genomics and Related Technologies", US Environmental Protection Agency, Research Triangle Park, NC (2002)
15. Symposium speaker, "Cyberteratology: investigating the physiological state of the embryo in silico", Society of Toxicology meetings, Salt Lake City UT (2003)
16. Invited speaker, "Cyberteratology: investigating the physiological state of the embryo in silico", Mid-Atlantic Reproduction and Teratology (MARTA) meetings, Philadelphia PA (2003)
17. Invited speaker, "Microarray analysis of developmental toxicity", Joint Midwest regional chapter – SOT and Midwest Teratology Society Meeting, Lincolnshire IL (2003)
18. Invited speaker, "Microarray Analysis: What Does it Teach us About Developmental Toxicity", Toxicogenomics International Forum 2003, Tokyo Japan, October 9-10, 2003
19. Invited Speaker, Application of Microarray Technology to Identify Biomarkers, International Conference on Biomarkers for Toxicology and Molecular Epidemiology: new tools for 21st century problems, Atlanta GA, March 17, 2004
20. Invited Speaker, "Birth Defects Systems Manager and Teratology Analyzer: A Beginning", Symposium on Computation Systems Biology and Implications for Developmental Toxicology: from molecules to systems", 44th Annual Meetings of the Teratology Society, Vancouver BC, CANADA, June 25 – July 1, 2004.
21. Invited Speaker, "Experimental Design and Interpretation of Gene Arrays in Context of Developmental Biology-Toxicology", 32nd Conference of the European Teratology Society, Thessaloniki, Greece (2004)
22. Invited Speaker, "Computational systems analysis of developmental toxicity using microarray data", Toxicogenomics International Forum, Kyoto Japan October 12-13, 2004.
23. Invited Speaker, "Computational Systems Analysis of a Disease Network. Satellite Conference on PBPK modeling, Asilomar Conference Grounds, Monterey CA, November 14-19, 2004.
24. Invited participant, "Consensus panel on renaming the peripheral benzodiazepine receptor (PBR)", hosted by Novartis Pharmaceuticals Corporation, Washington DC, December 17-18, 2004.
25. Invited Speaker, "Computational systems analysis of developmental toxicity". Texas A&M University, Center for Environmental Research, February 7, 2005.
26. Invited Speaker, "Computational systems analysis of developmental toxicity". Society of Toxicology, Symposium on "Systems Biology: Approaches and Applications to Toxicology", New Orleans LA, March 10, 2005.

27. Invited Speaker, "Mitochondrial retrograde-responsive pathways in the early mouse embryo", University of North Carolina, Department of Cell and Developmental Biology, April 6, 2005.
28. Invited Speaker, "BDSM, a Novel Database Resource for Birth Defects Research and Developmental Toxicity", Program for Computational Systems Biology, Greater Philadelphia Bioinformatics Alliance, Philadelphia PA June 7, 2005.
29. Invited Speaker, "Systems analysis of mitochondrial signaling networks in early mouse development", National Institute of Public Health (RIVM), Bilthoven, The Netherlands, September 1, 2005.
30. Invited Speaker, "Computational systems analysis of developmental toxicity", European Teratology Society, September 7, 2005, Haarlem, The Netherlands (symposium speaker).
31. Invited Speaker, "Comparative Bioinformatics in Development and Disease", James Madison University, Harrisonburg VA, December 2, 2005.
32. Invited Speaker, "Systems Biology", NIH / NIA workshop on microRNA and Aging, Bethesda MD, September 28, 2006.
33. Invited Speaker and Session Chair, "Top-down versus Bottom-up strategies", SAMSI: Biosystems modeling workshop, Research Triangle Park NC, March 5-7, 2007.
34. Speaker, "NADH balance during rotenone toxicity: a nongenomic, mitochondrion-based effect of tumor suppressor p53", Society of Toxicology, Charlotte NC, March 25-29, 2007.
35. Invited Speaker, "Toxicogenomic analysis of a biological threshold in developmental toxicity", 6th Annual International Conference on Hormesis: Implications for Toxicology, Medicine, and Risk Assessment, Amherst MA, May 1-3, 2007.

Presentations (since joining EPA in September 2007):

36. Seminar, "Computational Toxicology: New Approaches to Improve Environmental Health Protection", RIVM, Bilthoven The Netherlands, October 5, 2007.
37. Invited Speaker, "Comparative Bioinformatics: applications for developmental toxicology", 44th Congress of the European Societies of Toxicology, Amsterdam, The Netherlands, October 8, 2007.
38. Invited Speaker, "Computational Toxicology: New Approaches to Improve Environmental Health Protection", American Industrial Hygiene Association, Louisville KY, October 26, 2007.

39. Invited Speaker, "Computational Framework to Predict Toxicity and Prioritize Testing of Environmental Chemicals", NCAC-SOT, Bethesda MD, November 6, 2007.
40. Keynote speaker, "Virtual tissues and artificial life simulators: applications in birth defects research", Thomas Jefferson University, Philadelphia PA. Recipient, 2008 Distinguished Alumni Award, April 8, 2008.
41. Invited speaker, "Virtual tissues and Developmental Systems Biology", Gordon Research Conference, Musculoskeletal Biology and Bioengineering, July 3, 2008, Procter Academy NH.
42. Invited speaker, "Regulating Toxicity at the Edge-of-Chaos: journey through the eyes of a virtual embryo". NCEA/ORD's Mode of Action Workgroup, Washington DC. August 28, 2008,
43. Invited speaker, "The Virtual Embryo Project (v-Embryo™)", European Teratology Meetings, Edinburgh UK, September 22, 2008.
44. Invited speaker, "Virtual tissue models in developmental toxicity research", SOT 2009 Symposium: Incorporating 'omics in the study of reproduction and development, Baltimore MD, March 8, 2009.
45. Invited speaker, "EPA's Virtual Embryo", 1st International Workshop on Virtual Tissues, RTP NC, April 2, 2009.
46. Invited speaker, "Computational models of developing pathways and systems", ILSI-HESI, Developmental Toxicology New Directions workshop, Washington DC. April 30, 2009.
47. Keynote Speaker, "Virtual Embryo: in silico framework for predictive modeling", McGill University, Pharmacology Research Day, May 27, 2009.
48. Invited speaker, "Profiling Developmental Toxicity of 387 Environmental Chemicals using EPA's Toxicity Reference Database (ToxRefDB)." Joint TS-NBTS Platform session, Teratology Society, Rio Grande, Puerto Rico. June 29, 2009.
49. Invited speaker, "Modeling the Embryo. EPA's Virtual Embryo Project", Gordon Research Conference on Periodontal Diseases, Colby-Sawyer College, New London, NH. August 6, 2009.
50. Invited speaker, "Gene regulatory networks and the underlying biology of developmental toxicology", European Teratology Society Symposium on Molecular Aspects of Embryology and Teratology, Arles FR September 9, 2009.
51. Invited speaker, "Gene "EPA's Virtual Embryo: modeling developmental toxicity", Biocomplexity X, workshop on Quantitative Tissue Biology and Virtual Tissues, Indiana University, Bloomington, IN. October 29, 2009.

52. Invited speaker, "EPA's future testing strategy: the state of the science, predictive modeling and virtual tissues", Symposium, Implementation of the US National Research Council Report on Toxicity Testing in the 21st Century: Can We Make the Business Case for Alternatives?, Chicago, IL. November 5, 2009.
53. Invited speaker, "Virtual Embryo: HTS data to multicellular models", First Indian Virtual Bioinformatics Conference (Inbix '10), webcast, February 12, 2010.
54. Invited speaker, "Computational Toxicology and Short-term Assays for Identifying Developmental Toxicants", Workshop on Human Health Hazards Indicators, California EPA, Sacramento CA. March 16, 2010.
55. Invited speaker, "Virtual Embryo: HTS data to multicellular models", 1st European Zebrafish PI meeting, ova, Italy. March 19, 2010.
56. Invited speaker, "Pathway profiling and tissue modeling of developmental toxicity", workshop on The Zebrafish Embryo Model in Toxicology and Teratology, Karlsruhe Germany. September 3, 2010.
57. Keynote Lecture, "Pathway profiling and tissue modeling in developmental toxicity", ESNATS meeting on alternative testing strategies, Tallinn, Estonia, September 22, 2010.
58. Invited Speaker, "Virtual Embryo: systems modeling in developmental toxicity", Symposium on Novel Screening Methods in Developmental Toxicology, Society of Toxicology of Canada, Montreal, December 7. 2010.
59. Seminar, "Virtual Embryo", University of North Carolina, graduate program in Developmental Biology, Chapel Hill, April 25, 2011
60. Seminar, "Virtual Embryo: Predictive and Computational Modeling", Ohio State University, Nationwide Children's Hospital. April 28, 2011.
61. Invited speaker, "Consideration of genetic background for developmental anomalies in laboratory animals and humans", 7th Workshop on the Terminology in Developmental Toxicology, BfR, Berlin. May 4-6, 2011.
62. Invited Speaker, "The Virtual Embryo", AXLR8 workshop on Innovative Toxicity Testing Strategies, Berlin May 22-24, 2011.
63. Invited Speaker, High-throughput screening, predictive modeling and computational embryology. Brazilian Congress of Toxicology (CBTOX2011) Ribeirao Preto, Brazil, June 22-25, 2011.

64. Invited speaker, "Use of High-Throughput Testing and Approaches for Evaluating Chemical Risk – Relevance to Humans", symposium on Determining the Risk of Chemicals in Our Environment – Challenges and Opportunities for Advancement . Teratology Society, San Diego CA, June 25, 2011.
65. Invited speaker, "Systems modeling, a Perspective from Analysis of ToxCast Assays", NAS workshop on 'Mixtures and Cumulative Risk Assessment: New Approaches Using the Latest Science and Thinking about Pathways', NAS, Washington DC, July 27-28, 2011.
66. Invited speaker, "Virtual Embryo: systems modeling in developmental toxicity", at the summit: Current Trends in Developmental and Reproductive Toxicology: Biomarkers, Animal Models, Alternative Testing, Risk Assessment, and Regulatory Aspects. MPI Research 2011 summit, Kalamazoo MI, August 22, 2011.
67. Invited speaker, "Virtual Embryo: systems modeling in developmental toxicity. 8th World Congress on Alternatives and Animal Use in the Life Sciences, Tox21c session, Montreal CAN, August 22 (-25), 2011.
68. Seminar, "Computational toxicology and prenatal development", EPA Computational toxicology communities of practice, August 25, 2011.
69. Invited speaker, "Virtual tissue models", Advancing the Next Generation (NexGen) of Risk Assessment: Tier 2 and 3 Results Meeting, Webinar, August 31, 2011.
70. Invited speaker, 'HTS and computational modeling for developmental toxicity', Continuing education course on "omics for beginners", European Teratology Society annual meeting, Gent Belgium, September 4 (-7), 2011.
71. Invited speaker, "ToxCast: a model for advanced alternative risk assessment. Workshop on Roadmap for Cosmetic Industry" CAAT-Europe Information Day, Status and Future of Systemic Toxicity Testing for Chemicals and Cosmetics. Konstanz Germany, October 13, 2011.
72. Invited speaker, "Virtual embryo: systems modeling of developmental toxicity" SOT symposium 'In vitro and in vivo alternative models of developmental toxicity of pharmaceutical compounds', Society of Toxicology, 51st Annual Meeting, San Francisco CA, March 13, 2012.
73. Participant, meeting of the Extended Advisory Group (EAG) on Molecular Screening and Toxicogenomics (June 7-8, 2012) in Paris to discuss Adverse Outcome Pathways (AOPs).
74. Invited speaker, 'EPA computational toxicology research programme' (June 10) at the EU FP7 project AXLR8-3, workshop on "Roadmap to Next Generation Safety Testing under Horizon 2020", June 10-13, 2012, Berlin.

75. Invited speaker, 'Virtual Tissue Simulators: focus on early life-stage susceptibility' (June 13) at the 'MoA/AoP pathway elucidation – reproductive & developmental toxicity' symposium of the EU FP7 project AXLR8, workshop on "Roadmap to Next Generation Safety Testing under Horizon 2020", June 10-13, 2012, Berlin.
76. Invited speaker, "Computational Embryology: simulating dysmorphogenesis", CompuCell3D workshop, The Hamner Institutes, Research Triangle Park, NC, August 1, 2012.
77. Invited participant and speaker, "Species-Specific Predictive Signatures of Developmental Toxicity using the ToxCast Chemical Library" (with Nisha Sipes)", ILSI-HESI-DART Fall meeting, Second Species workgroup. Washington DC (September 25, 2012).
78. Invited speaker, Computational toxicology and in silico modeling of embryogenesis, symposium on "Alternative Approaches in Reproductive Toxicity Assessment", European Teratology Society, Linz, Austria September 3-5, 2012.
79. Invited speaker, Simulating Developmental Toxicity in a Virtual Embryo, ETS-EUSAAT symposium on "Innovations and applications of the embryonic stem cell test", European Teratology Society, Linz, Austria September 3-5, 2012.
80. Invited speaker, "Virtual Embryo: focus on early lifestage susceptibility", Session VII: Computational Systems Biology: Advances in Pathways to Organ Models, at the 33rd Annual Meeting of the Toxicology Forum, Brussels BE (October 23-25, 2012).
81. Invited Speaker (remote), "Virtual Embryo: computational embryology and predictive toxicology", Scientific Software Innovation Institute, conference on 'Toward the 3D Virtual Cell', Institute for Translational Biology (<http://itsb.ucsd.edu>), San Diego CA (December 13-14, 2012).
82. Invited Speaker, "Computational Embryology and Predictive Toxicology" at the University of Georgia Interdisciplinary Toxicology Program on 'Environmental and Ecotoxicology', University of Georgia, Athens GA (April 5, 2013).
83. Invited Speaker, "Computational Embryology and Predictive Toxicology", spring meeting on "Advances in In Vitro Toxicology and In Silico Modeling", Michigan Chapter of the SOT, Kalamazoo MI (May 10, 2013).
84. Invited Speaker, "Predictive Models and Computational Toxicology", 2nd Ibero-American Meeting on Toxicology and Environmental Health (IBAMTOX), Ribeirao Preto-SP, Brazil (June 17, 2013).
85. Session Chair, European Teratology Society, Stresa Italy, September 8-11, 2013.

86. Invited Speaker, "Update on Virtual Tissue Models", University of Konstanz and CAAT-Europe, Germany, September 12-13, 2013 (Outside Activity).
87. Invited Speaker, "Predictive Models and Computational Embryology", ESNATS Conference, University of Linz, Austria, September 16-17, 2013 (Outside Activity).
88. Invited Speaker, "Multiscale Data integration and Modeling" OpenTox InterAction Meeting on Innovation in Predictive Toxicology, Research Triangle Park NC, October 29-30, 2013
89. Keynote Speaker, "Computational Embryology and Predictive Toxicology", American Society for Cellular and Computational Toxicology (ASCCT), NIH, Bethesda MD, October 31, 2013.
90. External Expert Reviewer, Developmental and Reproductive Toxicity (DART) portion of the internal Sanofi workshop on "Predictive ADMET II", Waltham MA, November 12-13, 2013.
91. Keynote Lecture (invited) "Virtual Tissue Models for Predictive Toxicology", for the Human Health Effects Workshop, University of Quebec group in Environmental Toxicology, Chemistry, and Engineering, Montreal, December 10, 2013.
92. Webinar (invited) "Virtual Embryological Systems: challenges for predictive toxicology", presented to the New Jersey Association for Biomedical Research, December 12, 2013.
93. Invited Speaker, "Predictive Modeling of Developmental Toxicity: AOPs, VTMs, and the CEH roadmap", OEHHA Children's Environmental Health Symposium, Sacramento, February 25-26, 2014.
94. Speaker "AOP Frameworks for Simulating Dysmorphogenesis" and Co-Chair, CE Basic Course (AM04) "Elucidating Adverse Outcome Pathways (AOPs) for Developmental Toxicity", Society of Toxicology, Pheonix, March 23, 2014.
95. Invited Speaker, "Revolution in Toxicity Testing and Risk prediction for Chemicals in the Environment", Symposium on Innovations in Male Environmental Health Protection, American Society for Andrology, 2014 Annual Meeting, Atlanta GA, April 8, 2014.
96. Speaker, "Quantitative Spatial Temporal Predictive Modeling", International Symposium on Developmental Toxicology & 8th Terminology Workshop, May 14-16, 2014 BfR, Berlin.
97. Joseph Warkany Lecture, "Teratology v2.0 – a path forward", Teratology Society - June 29, 2014 Bellevue, WA.
98. Invited Speaker, "Synthetic Biology: 'flipping the switch' on opportunities and challenges with virtual tissues", CompuCell3D Workshop, Research Triangle Park, August 14, 2014.

99. Speaker and Co-Chair, "Multiscale modeling and simulation of embryogenesis for in silico predictive toxicology", 9th World Congress on Alternatives and Animal use in the Life Sciences, August 24-28, 2014, Prague, Czech Republic.
100. Seminar, "Predictive Toxicology and Virtual Tissue Models", Hannover Medical School, August 29, 2014.
101. Invited Speaker, "Identifying Key Events in AOPs for Embryonic Disruption using Computational Toxicology", European Teratology Society, "AOP symposium", September 2, 2014 – Hamburg.
102. Invited speaker, Invited speaker, "Computational Enablers: From Data Integration to Dynamic Modeling", Symposium on "Systems Toxicology: the Future of Risk assessment", American College of Toxicology, annual meeting, Orlando FL. November 10, 2014. S3.
103. Invited Speaker, "Virtual Embryo: from data integration to spatial dynamics and predictive toxicology". NIH / NIEHS seminar series, RTP. January 16, 2015.

Selected Assistance/Advisory Support to the EPA (2007-13):

- 2007-present: PI for the Virtual Embryo Project
- 2008: STQB panel
- 2008-present: Member Tox21 Workgroup
- 2009: Search Committee, ISTD Division Director (NHEERL)
- 2009: Technical Evaluation Panel, NCCT
- 2009: Faculty participant, 12th Annual Biomedical Career Fair
- 2010-present: NCCT Liaison, Texas Indiana Virtual STAR Center (NCER)
- 2010: Judge, NLTO postdoct. poster competition
- 2010: EMVL and HPC Peer Review Board
- 2010: ORD Scientific Computing Open House, Virtual Embryo Project
- 2010: Technical Evaluation Panel, NCCT
- 2011-ORD lead, Priority-setting Workplan (21st Century workplan)
- 2011: Led writing team, 'Developmental Toxicity Models' (NCCT - RFP)
- 2011: Chemical Safety for Sustainability (CSS) Research Program: Systems Models Topic Co-lead
- 2011: CSS Project Planning Lead for Systems Project 2 (Virtual Tissues)
- 2011-present: CSS Project Action Lead, Project #2: Virtual Tissues
- 2011-present: Task Co-Lead, CSS 2.2.2 (Virtual Embryo)
- 2012: Led CSS response to Children's Health and Protection Advisory Committee, Dec 21 FACA letter
- 2013: CSS Project Planning, Phase-I Project Lead for 'Virtual Tissue Models'
- 2013-14: CEH roadmap team
- 2013-14: TCE and Congenital Heart Defects IRIS team
- 2014: CSS Project Planning, Phase-II Project Lead for 'Virtual Tissue Models'

Other Leadership roles (selected):

Co-Chair, Steering Committee for FutureTox-III Contemporary Concepts in Toxicology (2014-15)
 Co-Chair, Steering Committee for FutureTox-II Contemporary Concepts in Toxicology (2013-14)
 Scientific Liaison Coalition, Society of Toxicology (2009-present, Chairman - 2012-13)
 Advisory Board, ILSI HESI-DART Technical Committee (2012-present)
 Principal Investigator, EPA's Virtual Embryo (2007-present)
 Editor-in-Chief, Reproductive Toxicology (2003 – present)
 Co-Editor, Developmental Toxicology (Comprehensive Toxicology Series – Elsevier, 2009)
 President of the Teratology Society (2007-08)
 Strategic Planning Retreat, Teratology Society (2012, 2007, 2002, 1997)
 Chairman, Program Committee, 47th Annual Meeting of the Teratology Society
 Council of the Teratology Society (1999-02 and 2005-09)
 Scientific Advisor, Dev Repro Tox Tech Committee, ILSI-HESI (2012-present)
 European Commission, Expert Panel (FP7)
 Steering Committee, First International Workshop on Virtual Tissues (EPA, April 21-23, 2009)
 Steering Committee, ILSI-HESI DART Workshop on “Developmental Toxicology New Directions”, Leader – New Technologies (2009)
 Editorial Board, Birth Defects Research Part C (2002 – present)
 Editorial review board, Developmental Dynamics (2002 – present)
 Director, Education Course “Risk Assessment in Developmental Toxicology”, Teratology Society, 1996
 FASEB delegate from Teratology Society (1998-01)
 NIH Human Embryology & Development II Study Section (1994-98)

Conferences / Symposia Organized:

Director, Education Course, “Risk Assessment in Developmental Toxicology”, Teratology meetings, Keystone CO (1996)

Organizer and Chairman, NIH/NICHD symposium on “Genomics in Birth Defects Research”, Teratology meetings, San Diego CA (1998)

Organizer and Chairman, Wiley-Liss symposium on “Pluripotent Stem Cells in and of the Embryo”, Teratology meetings, Montreal Canada (2001)

Organizer and Chairman, “Microarray Data Analysis and Bioinformatics Workshop”, Teratology Society, Scottsdale AR (2002)

Symposium Chair, “Systems Biology: a new venue for exploring mechanisms of developmental toxicity”, Society of Toxicology 2004 meetings, Baltimore MD.

Symposium Co-Organizer and Co-Chairman (with S Sumner), “Incorporating 'omics in the study of reproduction and development”, Society of Toxicology, Baltimore MD, March 8, 2009.

Chair, Work Group IV (New Technologies), ILSI-HESI Developmental and Reproductive Toxicology Technical Committee: Developmental Toxicology New Directions, ILSI Health and Environmental Sciences Institute, April 30 2009, Washington D.C.

Steering Committee, EC-US Workshop on Virtual Tissues, RTP NC, June 25-26, 2009.

Co-Organizer (with EZ Francis), Wiley-Blackwell Symposium, “Gene Regulatory Networks in Developmental Biology and Computational Toxicology”, 49th Annual Meeting of the Teratology Society, Rio Grande, Puerto Rico (June 27 – July , 2009)

Co-Organizer and Co-Chairman (with NC Kleinstreuer), Symposium “Vascular Developmental Toxicity: Identification, Prioritization, and Application” Society of Toxicology 2011 Meeting, Washington D.C., March 7, 2011.

Co-Organizer and Co-Chairman (with N Sipes), Wiley-Blackwell Symposium, “Zebrafish development: basic science to translational research”, Teratology Society 51th Annual Meeting, San Diego CA, June 28, 2011.

Co-Organizer and Co-Chairman (with DJ Dix), Symposium “An intelligent reproductive and developmental testing paradigm for the 21st century”, Society of Toxicology, San Francisco CA, March 13, 2012.

Co-organizer and Co-Chairman (with R Ellis-Hutchings) on “Predictive toxicology: screening tools and mechanistic support”, ILSI-HESI-DART Symposium, Teratology Society, Baltimore MD, June 27, 2012

Symposium, “Adverse Outcome Pathways (AOPs) in Predictive Toxicology” (co-chaired with N Sipes), Teratology Society 2013 (June, Tuscon AZ).

Co-organizer, FutureTox-II: pathways to prediction, Contemporary Concepts in Toxicology (SOT) conference, Chapel Hill NC, January 16-17, 2014.

Co-Chair, Session 1-1 “Virtual Tissue Models”, 9th World Congress on Alternatives and Animal use in the Life Sciences, August 25-28, 2014, Prague, Czech Republic.

Co-Chair, Workshop on “Microphysiological models of the developing nervous system: biologically driven assembly inspired by embryology and translated to human developmental toxicology.” Society of Toxicology, San Diego CA, March 26, 2015.

Short Courses Taught:

New Technologies to Analyze Teratogenic Mechanisms, Education Course of the Teratology Society, Montreal Canada (2001)

Web-based tools for teaching embryology and teratology, American Association of Anatomists meetings, Washington DC (2004)

Developmental toxicity through gene arrays and computational biology, The Henry Stewart Annual Briefing on Current thinking, problems, and solutions in Reproductive, Developmental and Endocrine Toxicity Studies, Washington DC (2004)

Synthesis of experimental and computational approaches for developmental toxicity, Henry Stewart Annual Briefing on "Current Thinking, Problems, and Solutions in Reproductive, Developmental and Endocrine Toxicity Studies", Washington DC, May 13, 2005.

Teratology Society, Refresher course, "Systems Biology Approaches to Birth Defects Research", Pittsburgh PA, June 24, 2007.

Early Life Exposures to Heavy Metals, Community Outreach Forum on Emerging Environmental Issues Affecting Women and Children's Health - Arsenic, Lead and Mercury Toxicity", Parke duValle Community Health Clinic, Louisville KY, August 22, 2007.

Systems Biology: practical and theoretical applications, Education course on Computational Toxicology, NCCT March 4, 2008

Classification of ToxCast Chemicals Utilizing ToxRefDB for Prenatal Endpoints, ToxCast™ forum for OPP, ORD/EPA, March 5, 2008

Computational Embryology, CASCADE (European network, course on developmental and reproductive toxicology), Berlin, November 5, 2008.

Why studies of mechanisms of abnormal development are important, Education Course, European Teratology Society, Arles FR, September 6, 2009.

Knudsen TB, Predicting Developmental Defects: Stem Cells and Computational Models. Briefing for ORD Congressional Staff Visit, RTP NC, January 13, 2011

CompTox Research for Children's Exposure and Risk Assessment, webinar at the "Children's Environmental Health Protection: Translating Science into Risk Assessment Practice" workshop, EPA Facility - Las Vegas, February 1, 2011

Knudsen TB, Virtual Embryo (Risk Assessment Forum – RTP, March 14, 2011, webinar)

HTS and predictive models, European Teratology Society, Continuing Education Course on ‘omics. Gent Belgium, September 4-7, 2011.

Virtual Tissue Models: focus on life-stage susceptibility, EPA Risk Assessment Forum on “Computational Toxicology Tools for Regulatory Decision Making: Senior Managers Briefing”, Washington D.C., May 21, 2012.

Invited Speaker: “Teratogenic Mechanisms, Pathways and Processes” in the Education Course, entitled “Principles of Teratology”, Teratology Society, Tucson AZ, June 22, 2013.

Invited Speaker and Co-Chair, “AOP Frameworks for Simulating Dysmorphogenesis”, CE Basic Course on ‘Elucidating Adverse Outcome Pathways (AOPs) for Developmental Toxicity’, SOT Phoenix AZ, March 23, 2014.

Invited Speaker, “How Are Computational Toxicology Methods Used to Prioritize Compounds for Testing?” Teratology Society, Sunrise mini-course, “Applications of Computational Biology in the Study of Birth Defects”. Seattle WA, July 1, 2014.

Invited Speaker, “Signatures for Predictive Toxicology”, European Teratology Society, “CE course on Molecular Pathways in Embryology” September 1, 2014 – Hamburg.

Invited speaker, “Building Cellular Pathways for the Future – The Virtual Embryo”. AM 005 course on “Future of Animal Testing and Reproductive Toxicology – building a bridge to the animal free zone” Society of Toxicology, San Diego CA – March 22, 2015.

Journal Reviewer for:

- ALTEX
- American Journal of Pharmacogenetics
- Assay and Drug Development Technology
- Birth Defects Research (Part A): Clinical and Molecular Teratology
- Birth Defects Research (Part B): Developmental and Reproductive Toxicology
- Birth Defects Research (Part C): Embryo Today Reviews
- Critical Reviews in Toxicology
- Current Pharmacogenomics and Personalized Medicine
- Developmental Dynamics
- Digestive Diseases and Sciences
- Drug Discovery Today
- Environmental Health Perspectives
- Expert Opinion in Drug Metabolism and Toxicology

- Future Medicinal Chemistry
- Journal of Chemical Information and Modeling
- Journal of Statistical Software
- Journal of Molecular Graphics and Modeling
- PLoS ONE
- Proc Natl Acad Sci USA
- Regulatory Toxicology and Pharmacology
- Reproductive Toxicology
- Systems Biology in Reproductive Medicine
- Toxicology and Applied Pharmacology
- Toxicological Letters
- Toxicological Sciences
- Toxicology

**Abstracts presented at national / international conferences
(shown for 2007-14):**

1. **Knudsen TB**. Comparative bioinformatics – applications for developmental toxicology. *Workshop on Reproductive Safety assessment: novel methodologies and intelligent testing strategies*. Congress of the European Societies of Toxicology (EUROTOX), 2007, Amsterdam.
2. **Knudsen TB**, Singh AV, Kavlock RJ, Dix DJ, Judson RS, Martin MT, Dellarco VL, Mendez E, and Reaves E. A Computational Framework for Systems-based Analysis of Developmental Toxicity. Society of Toxicology, 2008, Seattle.
3. Green M, Pisano M, Prough R, Singh A and **Knudsen T**. Post-translational modification of p53 during stress-induced release from the mitochondrion. Society of Toxicology, 2008, Seattle.
4. Kavlock RJ, Dix DJ, Houck K, Judson R, **Knudsen T**, Martin M, Richard A, Setzer W. ToxCast: Developing Predictive Signatures of Chemically Induced Toxicity. Society of Toxicology, 2008, Seattle.
5. States JC, Singh AV, Miller H, Piao Y, Ko M, Srivastava Sanjay and **Knudsen TB**. Prenatal arsenic exposure alters hepatic developmental programming predisposing to atherosclerosis. Society of Toxicology, 2008, Seattle.
6. **Knudsen T**. Using web-based tools for teaching embryology. *Symposium: Teaching embryology and teratology in the 21st century*. Teratology Society, 2008, Monterey.
7. Singh AV and **Knudsen TB**. Knowledge base for v-Embryo: information infrastructure for *in silico* modeling. Teratology Society, 2008, Monterey.
8. Knudsen TB, Kavlock RJ, Shah I, Dix DJ, Judson RS, Singh AV, Lau C and Hunter ES. The Virtual Embryo project (v-Embryo™). European Teratology Society, 2008, Edinburgh.
9. Sumner S and **Knudsen TB**. Symposium Overview, *Incorporating 'omics in the study of reproduction and development*. Society of Toxicology, 2009, Baltimore.
10. **Knudsen TB**, Shah I, Rountree MR, Singh AV and Kavlock RJ. Virtual tissue models in developmental toxicity research. *Symposium, Incorporating 'omics in the study of reproduction and development*. Society of Toxicology, 2009, Baltimore.

11. Dix D, Judson R, Elloumi F, Li Z, Wright F, Reif D, Rotroff D, Singh A, **Knudsen T** and Houck K. The Analysis of Genomic Dose-Response Data in the EPA ToxCast Program. Society of Toxicology, 2009, Baltimore.
12. Judson R, Dix D, Houck K, Martin M, Kavlock R, Shah I and **Knudsen T**. Prediction Modeling for Apical Toxicity within the ToxCast Data. Society of Toxicology, 2009, Baltimore.
13. Padilla S, Hunter DL, Padnos B, Corum D, Dix DJ, Houck KA, **Knudsen TB** and Martin MT. Screening of the ToxCast Chemical Library Using a Zebrafish Developmental Assay. Society of Toxicology, 2009, Baltimore.
14. Shah I, Pirone JR, Houck K, Vallanat B, Corton C, DeVito M, Judson R, Dix D, **Knudsen T** and Conolly R. v-Liver: Simulating Hepatic Tissue Lesions as Virtual Cellular Systems. Society of Toxicology, 2009, Baltimore.
15. **Knudsen T**, Houck K, Judson R, Singh A, Dix D and Kavlock R "Biochemical Activities of 320 ToxCast Chemicals Evaluated Across 23 Functional Targets. Society of Toxicology, 2009, Baltimore.
16. Elloumi F, Judson R, Dix DJ, Shah I, **Knudsen T**, Reif D, Singh A, Li Z and Wright F. Deriving Toxicogenomics Pathway-based Concentration Response Profiles. Society of Toxicology, 2009, Baltimore.
17. **Knudsen TB**, Martin MT, Kavlock RJ, Judson RS, Dix DJ and Singh AV. Profiling Developmental Toxicity of 387 Environmental Chemicals using EPA's Toxicity Reference Database (ToxRefDB). *Joint TS/NBTS symposium*. Teratology Society, 2009, Puerto Rico.
18. Singh AV and **Knudsen TB** (2009) Implementation of a Flexible Tool for Automated Literature-Mining and Knowledgebase Development (DevToxMine™). Teratology Society, 2009, Puerto Rico.
19. Edwards S, Preston J, Geller A, Jarabek A, Wolf D, Cohen Hubal E, Ankley G, El-Masri H, Shah I, Fowle J, Ross J, Nichols J, Crofton K, Devito M, Ramabhadran R, Kavlock R, Hunter S, **Knudsen T** and Mundy W. Toxicity Pathway-Based Mode of Action Modeling for Risk Assessment. NAS, *Toxicity Pathway-Based Risk Assessment: preparing for paradigm change*, 2009, Washington DC.
20. Conolly R, Shah I and **Knudsen T**. PBPK Models, BBDR Models, and Virtual Tissues: How Will They Contribute to the Use of Toxicity Pathways in Risk Assessment? Poster presented by R

Conolly. NAS, *Toxicity Pathway-Based Risk Assessment: preparing for paradigm change*, 2009, Washington DC.

21. **Knudsen TB**, Judson RS, Rountree M, Spencer RM and Singh AV (2009) Predictive modeling of developmental toxicity using EPA's Virtual Embryo. NAS, *Toxicity Pathway-Based Risk Assessment: preparing for paradigm change*, 2009, Washington DC.
22. **Knudsen TB**. Gene regulatory networks and the underlying biology of developmental toxicity. *Symposium on Molecular aspects of embryology and teratology*. European Teratology Society, 2009, Arles FR.
23. **Knudsen TB**. Virtual Embryo: HTS data to multicellular models. 1st European Zebrafish PI meeting, 2010, Padua It.
24. States JC, Singh A, **Knudsen T**, Rouchka E, Ko M, Piao Y, Ngalame NO, Arteel J, Arteel G, Srivastava S. Transplacental arsenic exposure induced changes in liver programming associated with accelerated atherosclerosis. Symposium, *Fetal Basis of Disease*, Society of Toxicology, 2010, Salt Lake City.
25. **Knudsen T**, Judson R, Rountree M, Kleinstreuer N, Sipes N, DeWoskin R, Chandler K, Singh A, Spencer R, Setzer R, Kavlock R and Dix D. Predictive Signatures of Developmental Toxicity Modeled with HTS data from ToxCast™ Bioactivity Profiles. Society of Toxicology, 2010, Salt Lake City.
26. Kleinstreuer N, Dix D, Judson R, Kavlock R, Rountree M, Sipes N, DeWoskin² R, Singh³ A, Spencer R, and **Knudsen T**. Modeling the disruption of vascular development in a Virtual Embryo using ToxCast HTS Bioactivity Profiles. Society of Toxicology, 2010, Salt Lake City.
27. **Knudsen T**. Pathway Profiling and Tissue Modeling Using ToxCast™ HTS Data. Invited presentation, ILSI-HESI symposium, *21st Century Developmental Toxicology*. Teratology Society, 2010, Louisville.
28. Sipes NS, Rountree MR, Kleinstreuer NC, Dix DJ, Judson RS, Kavlock RJ, Swat M, Glazier JA, DeWoskin RS, Singh AV, Spencer RM and **Knudsen TB**. Development of a Computational (in silico) Model of Ocular Teratogenesis. Teratology Society, 2010, Louisville.
29. Kleinstreuer N, Dix D, Judson R, Kavlock R, Sipes N, Reif D, Chandler K, Rountree M, DeWoskin R, Singh A, Spencer R, and **Knudsen T**. A toxicity signature for species-specific

disruption of embryonic vasculogenesis derived from ToxCast in vitro profiling data. Teratology Society, 2010, Louisville. (* *Wilson Award for best postdoctoral presentation*).

30. Chandler K, Hunter S, Jeffay S, Nichols H, Hoopes M, Barrier M, Habig J and **Knudsen T**. High-throughput Screening of ToxCast™ Phase I Chemicals in an Embryonic Stem Cell Assay Reveals Potential Disruption of a Critical Developmental Signaling Pathway. Teratology Society, 2010, Louisville.
31. Rountree MR, Shirinifard A, Kleinstreuer NC, Sipes NS, Swat M, Singh AV, Spencer RM, DeWoskin2 RS, Glazier JA and **Knudsen TB**. Multicellular Models of Morphogenesis. Teratology Society, 2010, Louisville.
32. Shah I, A Singh, C Haugh, J Jack, R Judson, **T Knudsen**, M Martin and J Wambaugh. ToxPlorer™: A Comprehensive Knowledgebase of Toxicity Pathways Using Ontology-driven Information Extraction. Society of Toxicology, 2011, Washington DC.
33. Chandler K, Hunter S, Jeffay S, Nichols H, Hoopes M, Barrier M, Sipes N, Kleinstreuer N, Singh A and **Knudsen T**. High-throughput Screening of ToxCast™ Phase I Chemicals in a Mouse Embryonic Stem Cell (mESC) Assay Reveals Disruption of Potential Toxicity Pathways. Society of Toxicology, 2011, Washington DC.
34. Sipes NS, Kleinstreuer NC, Judson RS, Reif DM, Singh AV, Chandler KJ, Rountree MR, Dix DJ, Kavlock RJ and **Knudsen TB**. Probing the ToxCast™ Chemical Library for Predictive Signatures of Developmental Toxicity. Society of Toxicology, 2011, Washington DC.
35. Martin M, **T Knudsen**, N Kleinstreuer, N Sipes, S Hunter, K Houck, D Rotroff, D Reif, R Judson, R Kavlock and D Dix. Modeling Reproductive and Developmental Toxicity for Chemical Prioritization into an Integrated Testing Strategies. Society of Toxicology, 2011, Washington DC.
36. Kleinstreuer NC, West PR, Weir-Hauptman AM, Smith AM, **Knudsen TB**, Donley ERL and Cezar GG. Predicting Developmental Toxicity in a Subset of the ToxCast Phase I Chemicals Using Human Embryonic Stem Cells and Metabolomics. Society of Toxicology, 2011, Washington DC.
37. **Knudsen TB** and Kleinstreuer NC. *Symposium, Vascular Developmental Toxicity: Identification, Prioritization, and Application*. Society of Toxicology, 2011, Washington DC.

-
38. **Knudsen TB**, Rountree MR, DeWoskin RS, Kleinstreuer NC, Sipes NS, Chandler KJ, Singh AV, Spencer RM. Chemical disruption of limb morphogenesis in a predictive virtual embryo model. Society of Toxicology, 2011, Washington DC.
39. Sipes NS, Martin MT, Reif DR, Kleinstreuer NC, Padilla S, Rountree MR, Singh AV, Judson RS, Dix DJ, Kavlock RJ and **Knudsen TB**. Predictive Modeling of Developmental Toxicity. *Invited speaker, symposium on Implementation of Developmental Toxicity Safety Evaluation in the 21st Century*. Teratology Society, 2011, San Diego.
40. Rountree MR, DeWoskin RS, Kleinstreuer NC, Sipes NS, Chandler KJ, Singh AV, Spencer RM and **Knudsen TB**. Modeling limb-bud dysmorphogenesis in a predictive virtual embryo. Teratology Society, 2011, San Diego.
41. Singh AV, Shah I, Nisha S, Reif D and **Knudsen TB**. Chemical prioritization for developmental toxicity using literature mining-based weighting of ToxCast assays. Teratology Society, 2011, San Diego.
42. Jeffay S, Barrier M, Nichols H, Singh AV, Chandler K, **Knudsen T** and Hunter S. Effects of the EVCAM chemical validation library on differentiation using marker gene expression in mouse embryonic stem cells. Teratology Society, 2011, San Diego.
43. Chandler K, Hunter H, Jeffay S, Nichols H, Kleinstreuer N, Sipes N and **Knudsen T**. A redox sensitive pathway in the mouse ES cell assay modeled from ToxCast HTS data. Teratology Society, 2011, San Diego.
44. Kleinstreuer N, Rountree M, Sipes N, Chandler K, DeWoskin R, Singh A, Spencer R, Kavlock R, Dix D and **Knudsen T**. In silico Testing of Environmental Impact on Embryonic Vascular Development. Teratology Society, 2011, San Diego. (* *Wilson Award for best postdoctoral presentation*).
45. **Knudsen TB**. Use of High-Throughput Testing and Approaches for Evaluating Chemical Risk – Relevance to Humans. *Symposium, Determining the Risk of Chemicals in Our Environment – Challenges and Opportunities for Advancement*. Teratology Society, 2011, San Diego.
46. Hoopes M, Kleinstreuer N, Chandler KC, Knudsen T and Hunter S (2011) Effects of 5HPP-33, an anti-angiogenic thalidomide analog, in mouse whole embryo culture. Teratology Society, 2011, San Diego.

-
47. Sipes NS, Martin MT, Reif DM, Kleinstreuer NC, Judson RS, Singh AV, Chandler KJ, Dix DJ, Kavlock RJ and **Knudsen TB**. Probing the ToxCastTM Chemical Library for Predictive Signatures of Developmental Toxicity. Teratology Society, 2011, San Diego.
48. Rotroff D, Dix D, **Knudsen T**, Martin M, Singh A, McLaurin K, Reif D and Judson R. Using ToxCast Data to Characterize Assay Utility for More Efficient Endocrine Disruptor Screening. Society for the Study of Reproduction, 2011, Portland.
49. **TB Knudsen**. Virtual embryo: systems modeling of developmental toxicity. *Invited speaker, symposium on In vitro and in vivo alternative models of developmental toxicity of pharmaceutical compounds*, Society of Toxicology, 2012, San Francisco.
50. Kleinstreuer N, Houck K, Judson R, Reif D, Kothiya P, Martin M, **Knudsen T**, Richard A, Polokoff M, Yang J, Berg E, Kavlock R and Dix D. Biological profiling of the ToxCast Phase II Chemical Library in Primary Human Cell Co-Culture Systems. Society of Toxicology, 2012, San Francisco.
51. Sipes NS, Reif DR, Houck K, Martin MT, Kothiya P, Richard A, Judson R and **Knudsen TB**. Activity profiles of 676 ToxCast Phase II compounds in 231 biochemical high-throughput screening assays. Society of Toxicology, 2012, San Francisco.
52. Ellis-Hutchings RG, Settivari RS, McCoy AA, Kleinstreuer NC, Marshall VA, **Knudsen TB**, and Carney EW. Application of Targeted Functional Assays to Assess a Putative Vascular Disruption Developmental Toxicity Pathway Informed By ToxCast High-Throughput Screening Data. Society of Toxicology, 2012, San Francisco.
53. Shah I, Jack J, Wambaugh J, Setzer W and **T Knudsen**. Virtual Liver: An in silico Framework for Analyzing Chemical-induced Hepatotoxicity. Society of Toxicology, 2012, San Francisco.
54. Chandler KJ, Hunter S, Hoopes M, Jeffay S, Nichols H, Kleinstreuer N and **Knudsen T**. Redox Disrupting Potential of ToxCast Chemicals Ranked by Activity in Mouse Embryonic Stem Cells. Society of Toxicology, 2012, San Francisco.
55. Dix DJ and **Knudsen TB**. *Symposium, An intelligent reproductive and developmental testing paradigm for the 21st Century*. Society of Toxicology, 2012, San Francisco.
56. Kleinstreuer NC and **Knudsen TB**. vEmbryo In Silico Models: Predicting Vascular Developmental Toxicity. *Invited, Wiley-Blackwell Symposium Computational Embryology*, Teratology Society, 2012, Baltimore.

-
57. Sipes NS, Martin MT and **Knudsen TB**. Species-Specific Predictive Signatures of Developmental Toxicity Using the ToxCast Chemical Library. *Invited, ILSI-HESI Symposium 'Predictive Toxicology'*, Teratology Society, 2012, Baltimore.
58. Frame AM, R.S. Judson, **T Knudsen**, M. Leung, Kevin Crofton, B Robaire (2013) An in-silico model of spermatogenesis for use in predictive toxicology. Society of Toxicology, 2013, San Antonio.
59. Leung MCK, McLaurin K, Phuong J, Sipes NS, Baker NC, Kleinstreuer NC, Frame AM, Judson RS, Dix DJ, Klinefelter GR, Martin M and **Knudsen TB** (2013) Profiling the activity of environmental chemicals in causing Testicular Dysgenesis Syndrome using the U.S. EPA Toxicity Reference Database (ToxRefDB). Society of Toxicology, 2013, San Antonio.
60. Judson R, D Rotroff, M Martin, D. Reif, K Houck, P Kothia, N Sipes, **T Knudsen**, M Xia and R Huang (2013) Structural classification of 1848 chemicals evaluated for estrogenic activity in 13 HTS assays. Society of Toxicology, 2013, San Antonio.
61. Rotroff D, Dix D, Reif D, Sipes N, **Knudsen T**, Kothia P, Martin M, Houck K and Judson R (2013) Combining Pathway-Based In Vitro Assays to Prioritize 1848 Environmental Chemicals for Estrogenic Potential. Society of Toxicology, 2013, San Antonio.
62. Baker NC, **TB Knudsen**, KM Crofton (2013) High-Throughput Electronic literature libraries (e-libraries) to support development of toxicity prediction models and adverse outcome pathways (AOPs). Society of Toxicology, 2013, San Antonio.
63. Kleinstreuer NC, Sarkanen R, Heinonen T and **Knudsen TB** (2013) Validation of a ToxCast Predictive Signature for Vascular Disruption in a Complex Angiogenesis Assay. Society of Toxicology, 2013, San Antonio.
64. Hutson MS and **Knudsen TB** (2013) Cell-level Model of Morphogenetic Tissue Fusion for Computational Toxicology. (Translational Bridging Scientist Award), Society of Toxicology, 2013, San Antonio.
65. Chandler KJ, Hansen JM, **Knudsen TB**, and Hunter ES (2013) Investigation of a redox sensitive predictive model of mouse embryonic stem cell differentiation via quantitative nuclease protection assays and glutathione redox status. Society of Toxicology, 2013, San Antonio.

66. **Knudsen TB**, MR Rountree, ES Hunter, NC Baker, R Spencer, RS Dewoskin and RW Setzer (2013) Predicting cellular dynamics and key events in developmental toxicity with a multicellular systems model. Society of Toxicology, 2013, San Antonio.
67. Sipes NS, Hutson MS, Baker NC, **Knudsen TB** (2013) Computational Embryology and Predictive Toxicology of Cleft Palate. Teratology Society, 2013, Tucson.
68. Chandler KJ, Hansen JM, **Knudsen TB**, and Hunter ES (2013) Evaluation of a redox-sensitive predictive model of mouse embryonic stem cell differentiation using multiple differentiation markers and windows of development. Teratology Society, 2013, Tucson.
69. Ahir BK, Sipes NS, Baker NC, Leung MCK, DeWoskin RS, Spencer RM, Judson RS, Martin MT and **TB Knudsen** (2014) Computational Modeling of Limb Development using ToxCast High-Throughput Screening Data for Predictive Toxicology. Society of Toxicology, 2014, Phoenix.
70. Baker NC, Sipes NS, Hutson MS and **Knudsen TB** (2014) Building a Cleft Palate Adverse Outcome Pathway Framework through HTS Data and Literature Mining Integration. Society of Toxicology, 2014, Phoenix.
71. Franzosa JA, Settivari RS, Ellis-Hutchings RG, Kleinstreuer NC, Houck KA, Carney EW and **Knudsen TB** (2014) RNA-Seq analysis of the functional-link between vascular disruption and adverse developmental consequences. Society of Toxicology, 2014, Phoenix.
72. Houck K, Kleinstreuer N, Yang J, Berg E, **Knudsen T**, Richard A, Martin, M, Reif D, Judson R and Polokoff M (2014) Predicting Toxic and Therapeutic Mechanisms of the ToxCast Chemical Library by Phenotypic Screening. Society of Toxicology, 2014, Phoenix.
73. Judson R, Houck K, Martin M, Richard A, **Knudsen T**, Sipes N, Shah I, Little S, Wambaugh J, Setzer W, Rabinowitz J, Linnenbrink M, Franzosa J, Kothiya P, Phuong J, McLaurin K, Filer D, Leung M, Strope C, Truong L, Thomas R, Smith D, Reif D, Rotroff D, Kleinstreuer N, Xia M and Huang R (2014) In Vitro Screening of 1877 Industrial and Consumer Chemicals, Pesticides and Pharmaceuticals in up to 782 Assays: ToxCast Phase I and II. Society of Toxicology, 2014, Phoenix.
74. Leung MC, Sipes NS, Baker NC, Ahir B, Wolf CJ, Seifert AW, Hutson MS, Darney SP, Spencer RM and **Knudsen TB** (2014) Computational Embryology and Predictive Toxicology of Hypospadias. Society of Toxicology, 2014, Phoenix.

-
75. Leung MC and **Knudsen TB** (2014) Does Evolution Matter in toxicity testing? Rethinking Cross-Species Extrapolation in Hazard Characterization. Society of Toxicology, 2014, Phoenix.
76. Tal T, Kleinstreuer N, Harris P, Olin J, Palekar A, Toimela T, Sarkanen R, Heinonen T, Wood C, Hemmer M, **Knudsen T** and Padilla S (2014) Adverse Outcome Pathway for Embryonic Vascular Disruption and Alternative Methods to Identify Chemical Vascular Disruptors During Development. Society of Toxicology, 2014, Phoenix.
77. Heinonen T, Toimela T, **Knudsen TB**, Kleinstreuer N and Sarkanen J-R (2014) Evaluation of environmental chemicals computationally predicted to disrupt angiogenesis. Society of Toxicology, 2014, Phoenix.
78. Nicholas CI, Goldsmith MR, Ahir B, **Knudsen TB**, Rabinowitz J, Setzer RW, Mansouri K and Wambaugh JF (2014) High Throughput Modeling of Indoor Exposures to Chemicals. Society of Toxicology, 2014, Phoenix.
79. **Knudsen TB** (2014) Revolution in Toxicity Testing and Risk Prediction for Chemicals in the Environment, American Society for Andrology, 2014, Atlanta.
80. Sipes, NS, **Knudsen TB**, Firestone MP and Cohen-Hubal, E (2014) EPA's Children's Environmental Health Roadmap: applying the 21st century vision to prenatal development. Teratology Society, 2014, Bellevue WA.
81. Ahir BK, Sipes NS, Baker NC, Leung MCK, DeWoskin, R Spencer, Judson RS, Martin MT, and **Knudsen TB** (2014) Predictive Models of Skeletal Developmental Defects from ToxCast High-Throughput Screening Data. Teratology Society, 2014, Bellevue WA.
82. Leung MC, Hutson MS, Belmonte JM, Swat M, Sipes NS, Baker NC, Spencer RM, Seifert AW, Perreault SD, Glazier JA and **Knudsen TB** (2014) Computational Embryology and Predictive Toxicology of Hypospadias. Symposium on "Testicular Dysgenesis Syndrome (TDS)" at the Teratology Society, 2014, Bellevue WA.
83. **Knudsen TB** (2014) Teratology v 2.0: building a path forward. 'Josef Warkany Lecture', Teratology Society, 2014, Bellevue WA.
84. **Knudsen T** (2014) "Multiscale modeling and simulation of embryogenesis for in silico predictive toxicology", 9th World Congress on Alternatives and Animal use in the Life Sciences, August 24-28, 2014, Prague, Czech Republic. ALTEX Proceedings. 3: 14.

85. Kleinstreuer N, **Knudsen TB**, Tal T, Heinonen T, Franzosa J, Baker N, Padilla S, Carney E and Casey W (2014) Constructing, quantifying, and validating adverse outcome pathways for vascular developmental toxicity. 9th World Congress on Alternatives and Animal use in the Life Sciences, August 24-28, 2014, Prague, Czech Republic. ALTEX Proceedings. 3: 55.
86. **Knudsen T** (2014) Supporting RRRs through “Special Issues” and the role of journals in “big data”. 9th World Congress on Alternatives and Animal use in the Life Sciences, August 24-28, 2014, Prague, Czech Republic. ALTEX Proceedings. 3: 171.
87. **Knudsen TB**, Kleinstreuer NC, Heinonen T (2014) Adverse Outcome Pathway for Embryonic Vascular Disruption: ToxCast HTS predictive model qualified by a validated human angiogenesis assay. Poster, ToxCast Data Summit, RTP, Sept 29-30, 2014.
88. Tal T, Kleinstreuer N, Toimela T, Sarkanen R, Heinonen T, **Knudsen T** and Padilla S (2014) Identification of chemical vascular disruptors during development using an integrative predictive toxicity model and zebrafish and in vitro functional angiogenesis assays. Poster, ToxCast Data Summit, RTP, Sept 29-30, 2014.
89. Leung MCK, Phuong J, Baker NC, Sipes NS, Klinefelter GR, Martin MT, McLaurin KW, Richard AM, Woodrow RS, Perreault Darney S, Judson RS and **Knudsen TB** (2015) Profiling 774 Chemicals for Disruption of Male Reproductive Development: Hierarchical Relationship across Apical Endpoints (ToxRefDB) and Chemical-Effects Clusters for in vitro Bioactivity (ToxCast). Poster, ToxCast Data Summit, RTP, Sept 29-30, 2014.
90. Baker NC, Sipes NS, Grulke CM, Judson RS and **Knudsen TB** (2014) Causal Inferences from ToxCast Data: molecular pathways and cellular processes for cleft palate. Poster, ToxCast Data Summit, RTP, Sept 29-30, 2014.
91. Ahir BK, Sipes NS, Baker NC, Leung MCK, DeWoskin RS, Spencer RM, Judson RS, Martin MT and **Knudsen TB** (2014) Computational Embryology and Computational Modeling of Embryonic Limb Development using ToxCast High-Throughput Screening Data for Predictive Toxicology. Poster, ToxCast Data Summit, RTP, Sept 29-30, 2014.
92. Baker NC, Sipes NS, Grulke CM, Judson RS, and **Knudsen TB** (2015) Causal Inferences from mining ToxCast Data and the biomedical literature for molecular pathways and cellular processes in cleft palate. Society of Toxicology, San Diego CA – March 22, 2015.
93. Leung M, Phuong J, Baker N, Sipes NS, Klinefelter GR, Martin MT, McLaurin KW, Setzer RW, Perreault SD, Judson RS and **Knudsen TB** (2015) Systems toxicology of male reproductive

development: profiling 774 chemicals for molecular targets and adverse outcomes. Society of Toxicology, San Diego CA – March 22, 2015.

94. Watt ED, Kapraun DF, **Knudsen TB**, Crofton KM and Judson RS (2015) Computational Modeling of Thyroid Hormone Regulated Neurodevelopment for Chemical Prioritization. Society of Toxicology, San Diego CA – March 22, 2015.

95. Hunter ES, Jeffay S, Hoopes M, Nichols H, Rosen M, Chandler KC, Judson RS and **Knudsen TB** (2015) Selective Biological activity of ToxCast Chemicals in mouse Embryonic Stem Cells identifies in vivo teratogens. Society of Toxicology, San Diego CA – March 22, 2015.

Research Grants (prior to joining EPA in 2007):

Principal Investigator, “ADA, Target in Molecular Teratogenesis”, grant R29 HD25143, National Institute of Child Health and Human Development, February 1, 1989-January 31, 1994
E Tennessee State University and Thomas Jefferson University

Principal Investigator, “ADA, adenosine, and embryo survival”, grant RO1 HD30302, National Institute of Child Health and Human Development, April 1, 1993-March 31, 1997
Thomas Jefferson University

Principal Investigator, “p53: Molecular Dosimeter for Developmental Toxicity”, cooperative grant CR 824445-01-0, US Environmental Protection Agency, October 1, 1995-June 30, 1999
Thomas Jefferson University

Principal Investigator, “Cellular and Molecular Determinants of Birth Defects”, grant no. T32 ES07282, National Institute of Environmental Health Sciences, July 1, 1998-June 30, 2003
Thomas Jefferson University

Principal Investigator, “Molecular Characterization of a Biological Threshold in Developmental Toxicity”, grant R 827445-01-0, US Environmental Protection Agency, October 1, 1999-September 30, 2003
Thomas Jefferson University

Principal Investigator, “Teratology Society Meetings: Travel for Students”, grant R13 ES012410, National Institute of Environmental Health Sciences, April 1, 2003 - March 31, 2004
Thomas Jefferson University

Principal Investigator, “Cellular and Molecular Determinants of Birth Defects”, grant no. T32 ES07282-11, National Institute of Environmental Health Sciences, July 1, 2003 - June 30, 2008
Thomas Jefferson University

Principal Investigator, "Teratology Society Meetings: Travel for Students", grant R13 ES013116, National Institute of Environmental Health Sciences, April 1, 2004 - March 31, 2005
Thomas Jefferson University

Principal Investigator, "Environmental Impact on the Embryonic mtDNA Genome", grant RO1 ES09120, National Institute of Environmental Health Sciences, February 1, 1998-May 31, 2007
Thomas Jefferson University and University of Louisville

Co-Principal Investigator, "Repository for Understanding Host-Microbe Interactions in Periodontal Pathogenesis", grant RFA AA044 from the CDC (D Kinane, PI), June 15, 2005-June 14, 2007
University of Louisville

Principal Investigator, "Perinatal Breast Cancer Programming: fat and estrogens", grant R21-ES013821 from the National Institute of Environmental Health Sciences, July 1, 2005-May 31, 2008
University of Louisville

Co-Investigator, "Proteomics based approach for early detection of fetal alcohol syndrome", grant P20-RR/DE17702 from the NIH (R Greene, PI), May 1, 2006-April 30, 2007.
University of Louisville

Co-Investigator, "Planning Grant for Louisville Clinical and Translational Science Award", grant P20-023523 from National Center for Research Resources (C McLain, PI), September 1, 2006-August 31, 2007
University of Louisville

Principal Investigator, "Response Signatures of Alcohol Related Birth Defects", grant NIH 2 R56-AA13205, National Institute on Alcoholism and Alcohol Abuse, July 1, 2001-June 30, 2008
Thomas Jefferson University and University of Louisville

Co-Investigator, "Center for Environmental Genomics and Integrative Biology", grant P30 ES014443 from National Institute of Environmental Health Sciences (K Ramos, PI), April 1, 2007-March 31, 2011
University of Louisville

Co-Investigator, "Epithelial cell TLRs in disease susceptibility", grant DE017384 from National Institute of Dental and Craniofacial Research (D Kinane, PI), April 1, 2007-March 31, 2012
University of Louisville